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THE PROSTATIC PROBLEM

A REVIEW BASED ON DEVELOPMENTS OF THE PAST THREE YEARS

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There has been a tremendous wave of excitement and enthusiasm about vesical neck resection, which has swept the whole country. It seems to me most appropriate to stop and take stock to see whether such an avalanche of cases is justified.

A great deal of attention has always been paid to obstructions at the vesical orifice. A knowledge of the presence of the prostate gland and its abnormalities was known to the ancients.

The history of early efforts to relieve prostatic obstruction by various instruments has been presented so often of late that a repetition here is unnecessary. Suffice it to say that the instruments were so inadequate and operations on the prostate improved in quality so materially that open surgical operations on the prostate were the procedures of choice. The development of safety factors and the resultant low mortality in this procedure cannot be carelessly laid aside on the appearance of improved mechanical instruments.

In our community there are some ten million souls, which means that there must be about five million males. Our clinic is not the largest in the country but it is and always has been a very active one. We average about 1,000 cases a month in our outpatient department in addition to the private cases of the twenty-four members of our staff. It is therefore evident that we have a great volume of cases to examine from which to choose our operable cases.

Up to May 1, 1933, we have done 144 closed vesical neck operations over a period of twelve and one-half years; therefore we listen with amazement to the reports of tremendous numbers of cases from the clinics of others with little if any more volume of patients than we ourselves have. There are reports of 300, 500, and one ambitious person has even reported over 900 cases of vesical neck resection, all done within the last three or four years. One may draw only one conclusion from these voluminous reports and that is that there are hundreds of patients being operated on who do not need the operation at all.

Some of the most active proponents of vesical neck resection openly promote the resection of any enlargement of the prostate whether there is residual urine or not. I cannot condemn this procedure too much because every one knows that vesical irritation due to enlargement of the prostate can often be cured by hot rectal douches, prostatic massage and the like. Furthermore, if one slices off the intra-urethral projecting part of the gland, the prostatic ducts are sealed off and the resulting scar prevents the proper drainage of pus, detritus and prostatic fluid, so that the prostate becomes a serious focus of infection. Thus this procedure can be considered only as meddlesome surgery and should be discountenanced by the thinking members of the profession.

A decided objection to the tidal wave of vesical neck resections is the fact that many physicians who are not properly trained surgeons are doing vesical neck operations. Such persons are not prepared to decide on the proper procedure to pursue or to do a prostatectomy, should it be the operation of choice.

It is my opinion that a urologic surgeon should be prepared to do any type of operation, not only on the urinary organs but on any part of the anatomy bordering on the urinary organs. The following is a case in point:

W. T., a white man, aged 62, admitted to the hospital, Nov. 29, 1932, had had the prostate gland removed at a hospital in Panama. On admission, the bladder was draining through a suprapubic sinus. November 30, a vesical neck resection with the Kirwin instrument was done. December 5, after a positive diagnosis of carcinoma had been obtained from the laboratory, ten seeds containing 20 millicuries of radon were introduced into the prostatic bed. His convalescence was uneventful until suddenly, December 8, he had severe pain in the right lower quadrant, and hemorrhage from the bladder was suspected. A suprapubic exploration showed no evidence of a rent in the bladder, and a right rectus incision was made to determine the cause of the trouble.

The peritoneum was opened and immediately revealed a moderate amount of free fluid, the wall of the intestine was injected and a walled-off ruptured appendix abscess was found. The appendix itself could not be definitely located. A large Penrose drain was inserted into the bladder and another into the abscess cavity. The patient progressed very well following the second operation. At one time it was necessary to put tubes down into the appendicular incision and irrigate with surgical solution of chlorinated soda. The suprapubic drain was removed and a catheter inserted, and, Jan. 7, 1933, the patient was discharged with a retention catheter in place to return to his home in Norfolk, Va.

Having decided to operate on the patient by means of vesical neck resection, the surgeon then proceeds to prepare the patient for the event. This preliminary preparation must be accomplished with as much thoroughness as for any type of prostatectomy. I protest vigorously against the common practice of minimizing vesical neck resection; particularly atrocious and untrue is the statement that it is a mere office procedure. My own experience and that of others, particularly that of Dr. Alcock, convinces any right-thinking person that this is as serious an operation as exists in surgery and

From the Department of Urology (James Buchanan Brady Foundation) of the New York Hospital.

Read before the Section on Urology at the Eighty-Fourth Annual Session of the American Medical Association, Milwaukee, June 15, 1933.

is not to be taken lightly in any sense of the word. I do not consider it necessary to go into the details of the preliminary preparation of the patient for prostatectomy, as that subject is now well understood by all urologists and most general surgeons. Suffice it to say that drainage should be accomplished by any necessary means until the patient is in as good general condition as he can be, as indicated by renal functional tests, blood chemistry and the like. A preliminary bilateral vasectomy is advisable.

TECHNIC OF THE OPERATION

The anesthesia used should be regional, as that is commonly considered to be the most suitable in cases of urinary disturbance.

The instrument to be used is the one with which the operator is most familiar. In our clinic we prefer the Kirwin vesical neck resector with the McCarthy unit, manufactured by Mr. F. C. Wappler. We use the Kirwin instrument because the end is protected, the vision is perfect and the pieces always come out. It is most important for the operator to confine his activities with this tremendously potent cutting device to the lower third of the vesical orifice. Any incision outside this area may lead to disaster, as the wall of the bladder neck at other points is thin and easily cut through.

If the field becomes clouded, one must irrigate until vision is perfect or wait until another day. Cutting in the dark is too dangerous and should be discountenanced absolutely.

All the bleeding of a serious nature should be controlled on the operating table. If it is impossible to do so with intra-urethral instrumentation, a suprapubic cystotomy should be done and the bleeding stopped under direct vision if necessary. If there is not excessive bleeding, an intra-urethral indwelling catheter size 22 or 24 F. is placed in position and held there by adhesive tape.

POSTOPERATIVE CARE

If the operation has been long continued and considerable blood lost, the patient is given an intravenous or subcutaneous infusion of physiologic solution of sodium chloride or Ringer's solution. The discomfort suffered after the effects of the anesthetic have worn off is controlled by hypodermic injections of codeine, and if these are not effective morphine may be used.

It is wise to keep at least 50 cc. of boric acid solution in the bladder at all times so that any blood occurring there will be well mixed with the solution and no jelly-like clots may collect to interfere with the passage of fluid out through the catheter. The bladder should be emptied every two hours and 50 cc. of fluid replaced for a period of about eight hours. Longer periods may be allowed to elapse between evacuations after this time. All fluids introduced into and returning from the bladder should be measured.

The scrotum should be elevated even when a bilateral vasectomy has been performed.

The hemoglobin should be taken before operation and daily thereafter, if indicated. If it drops to a dangerously low level, whole blood transfusion, as practiced by Dr. Rufus Stetson of New York, should be given, repeatedly, if necessary.

The urine of almost all prostatic patients is infected. The prostatic fluid always contains pus in clumps and a generous flora of bacteria. Therefore a major disturbance such as vesical neck resection is almost universally followed by cloudy infected urine, which persists for a long period of time.

The cut surface develops a slough which does not come away entirely for many weeks, and it is not uncommon for the urine of patients thus treated to be cloudy for several months. This almost never results seriously, although it annoys the meticulous patient. We have noticed that the older and more decrepit the patient, the more extensive the slough and the longer the persistence of cloudy urine.

All patients complain of frequency and dysuria after operation and some of them have difficulty in emptying the bladder for a long time. Many have some residual urine for a few days. A great many patients, however, pass a much better stream of urine from the beginning than was possible before operation, and some of them have very little pain.

It is our practice to irrigate the bladder daily while the patient is in the hospital and frequently for the first month after he leaves. A sound is passed at weekly intervals for two months after the operation and occasionally thereafter. Prostatic massage, hot rectal douches and sitz baths are recommended in many cases and found to be very beneficial.

A summary of the cases treated by vesical neck resection comparing the old Young punch cases with

Comparison of Results of Suprapubic Prostatectomy, Perineal Prostatectomy for Adenoma and Carcinoma, Young Punch and Vesical Neck Resection in the Department of Urology (James Buchanan Brady Foundation) of the New York Hospital up to May 1, 1933

	Total Number of Cases	Average Age, Years	Average Post-operative Stay, Days	Total Number of Deaths	Mortality Rate, per Cent
Suprapubic prostatectomy	70	62	25	8	11.43
Perineal prostatectomy for benign hypertrophy	535	66	21	26	4.8
Perineal prostatectomy for carcinoma	79	65	28	16	20.25
Vesical neck resection	89	57.7	13.4	9	10.11
Young punch	55	66	9.5	3	5.45
Total	828			62	7.48

the new vesical neck resections and the results of perineal and suprapubic prostatectomy is expressed best in the accompanying table, which is self explanatory.

COMPLICATIONS

Our experience is limited to a small group of carefully selected cases, and yet, even under almost ideal conditions, we have had every possible complication that we have ever experienced with prostatectomy.

Incontinence after this operation is rare, but we have experienced it in our group of cases several times. We are under the impression that it may occur as a result of too wide distention of the urethra, particularly of the external sphincter, both by the instrument and more particularly by the indwelling catheter afterward. It is our practice at present to use a rather small catheter after the operation. We feel that if it is not left in position too long there is not so much danger of permanent incontinence.

In this series of cases, all types of hemorrhage have been experienced. Profuse bleeding has occurred on the operating table, requiring the greatest amount of ingenuity to control it. In one case the bladder had to be opened and packed four hours after resection, although the condition was apparently under control when the patient left the operating room.

Another patient suddenly began to bleed four days after operation and the hemorrhage was so violent that

the bladder was opened and packed, and his life was saved by giving him an immediate blood transfusion.

A most interesting case of delayed hemorrhage was the following:

J. V., a man, aged 39, readmitted on several occasions recently, left this hospital, Oct. 24, 1932, following a surgical operation on the urinary bladder neck known as a "vesical neck resection." Two days later, October 26, he returned to the hospital complaining of having seen blood appearing in voided urine, and of passing small blood clots when urinating. At the time of that admission he remained in the hospital until October 29, when he was discharged as having improved.

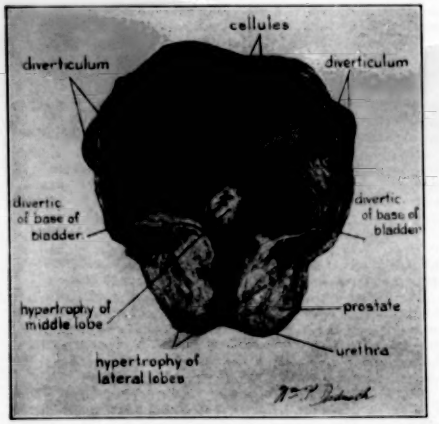

Fig. 1.—Moderately enlarged middle lobe, with slight enlargement and intra-urethral intrusion of lateral lobes. Hypertrophy is not yet too great to permit satisfactory resection.

November 5, he again returned to the hospital complaining of having voided bloody urine. At the time of this admission, it was found that bleeding was fairly well controlled, and the treatment given was conservative; however, November 12, recent hemorrhage was noted by the appearance of bright blood in the urine, and after efforts to control the bleeding had proved unsuccessful and distention of the urinary bladder from blood clots appeared, the indication for suprapubic cystostomy for control of the hemorrhage was evident. Accordingly, cystostomy was done under gas-oxygen anesthesia and the bleeding vessels about the vesical neck were ligated. The vesical neck was packed with petrolatum gauze to aid in control of hemorrhage. The postoperative course was quite uneventful and the patient was discharged, November 29, improved.

A man presented himself at our clinic who had had a prostatectomy performed some years previously. He gave a history of recurring symptoms. Rectal examination revealed no enlargement in the prostatic region. Cystoscopy showed a slightly distorted vesical orifice, but the real trouble was found in the prostatic urethra, where there was a nodule about the size of a small marble. This seemed to be an ideal case for the use of the resectoscope. Accordingly, one of my associates easily and efficiently removed the nodule in toto. The patient did well for a few days and then began to show evidence of dehydration, lowered vitality and finally shock, although there was less than the usual amount of bleeding. In spite of every effort on our part, he died. Autopsy revealed a most amazing condition. Apparently at the time of the operation the wire had burned barely through the prostatic capsule near its apex, but behind the triangular ligament a sizable vessel had bled outside the urinary tract. The areolar tissue extending upward as far as the diaphragm had absorbed the blood and, when dissected out and squeezed, gave up the blood just as a sponge would.

Two cases in our series have sloughed through at the vesical orifice resulting in pelvic cellulitis and peritonitis, and, in spite of prompt operation, as soon as the condition was recognized death resulted in both instances.

Our case of appendix abscess following vesical neck resection has already been described. Fortunately, prompt operation and efficient drainage saved the man's life.

Epididymitis is very common following vesical neck resection unless bilateral vasectomy is performed.

Recurrence of the condition is to be expected, as it is absolutely impossible to remove all the prostate with any instrument thus far devised. In our series we have had several recurrences already. All but one of these patients insisted on having the prostate removed by open operation. The one on whom another vesical neck resection was done said he would give the method one more chance and if it was not successful he would have the open operation.

WHAT OPERATION SHALL THE SURGEON PERFORM?

The question naturally arises, When shall the surgeon do a vesical neck resection, when shall he do a suprapubic prostatectomy and when a perineal prostatectomy?

It is my opinion that a vesical neck resection should be done when the patient's symptoms are accompanied by:

1. An enlargement of the subcervical group of glands with or without residual urine.
2. A fibrous bar at the vesical orifice.
3. Moderate adenomatous enlargement of the prostate with not too much tissue intruding into the bladder,

Fig. 2.—Moderate hypertrophy of middle lobe, but such marked intra-urethral enlargement of lateral lobes as to leave no room for the manipulation of the rectoscope. Such cases must be subjected to prostatectomy.

in which there is present residual urine, or when there is a history of repeated attacks of retention or difficult urination.

4. All possible cases of carcinoma of the prostate gland.

A suprapubic prostatectomy is the operation of choice when the main mass of the greatly enlarged

gland intrudes into the lumen of the bladder. Perineal prostatectomy should be performed on all others. Examination of the interior of the bladder either by cystoscopy or by observation at the time of suprapubic cystostomy for drainage tells the operator what type of procedure to follow.

Vesical neck resection is wrong in principle in cases that show evidence of absorption from a grossly infected adenomatous prostate. Partial resection of the mass results in sealing off the infected tubules of the prostate so that it becomes a serious focus of infection. The experiences that the members of the medical profession have had with similar treatment of the tonsils is ample reason not to make the same mistake. Such prostates should be removed entirely, and a partial operation is a serious menace to the health and life of the patient.

BENEFITS OF VESICAL NECK RESECTION

There are certain types of cases in which resection of the vesical neck is definitely indicated and when,

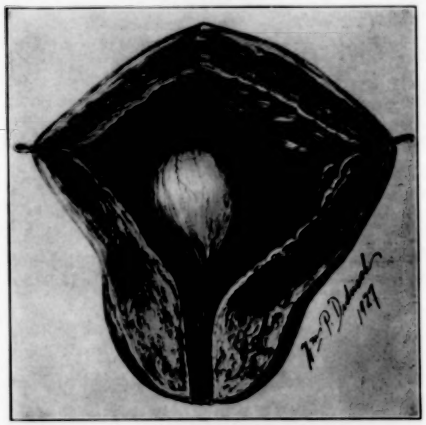

Fig. 3.—This tremendously enlarged prostate should be removed by open operation, as adequate removal with the rectoscope is impossible.

properly performed, it will result in spectacular relief of symptoms, which is most gratifying to the patient and the physician.

One of this group is illustrated by the patient suffering from an enlargement of the subcervical group of tubules. These patients have a maximum of symptoms, including frequent, painful urination and nocturia. They may have very little residual urine, which usually is clear. My own anatomic studies have shown that this lesion occurs in almost 25 per cent of all males over 30 years of age.

When a suitable patient is satisfactorily operated on by this method, he may expect to reduce the length of his hospital stay, and after the slough has come away and his urine is clear and sparkling it is most cheering to have brought this about without open operation.

ANALYSIS OF DEATHS

It is instructive to review the cause of death in our failures with a view to the prevention of future calamities.

Our first death occurred in a white man (L. C.), aged 48. He had a moderate intravesical intrusion of the subcervical group of tubules. This was removed with one of the new instruments. He showed evidence of shock some hours later. Suprapubic operation with drainage of the bladder and perivesical spaces, infusions and transfusions failed to prevent his death, Dec. 3, 1931, two days after the original operation.

The second death was that of H. D., a white man, aged 64, suffering from adenomatous hypertrophy of the prostate gland. A vesical neck resection was done, Jan. 26, 1932, under spinal anesthesia. He died from pneumonia fifteen days later.

The third patient to die was J. S., a man, aged 67, who was operated on, Feb. 25, 1932, for the removal of a recurrent tag of prostate that caused obstruction. He reacted poorly and finally went into a deep and fatal shock. His death occurred on the second day following operation. Autopsy showed extensive postperitoneal hemorrhage, which could not possibly have been relieved by a second operation.

The fourth death was that of P. H., a man, aged 57, who had a carcinoma of the prostate with obstruction. He was subjected to vesical neck resection, Sept. 14, 1932, with implantation of radium. He gradually became weaker and weaker, finally dying, Oct. 16, 1932. Autopsy was not obtainable.

The next death was that of R. G., a man, aged 70, who was suffering from a moderate sized, benign adenomatous prostate. He had a vesical neck resection, Sept. 21, 1932. The following day he suffered from a cerebral hemorrhage and died.

The sixth death was that of B. H., a man, aged 60, suffering from extensive carcinoma of the prostate with retention of urine. A vesical neck resection was performed, Sept. 30, 1932. He seemed to be doing excellently for a time but had a turn for the worse and died, November 7, the thirty-eighth postoperative day, of uremia.

The next death was that of R. F., a man, aged 76, who had a large adenomatous hypertrophy of the prostate gland. I was prevailed on to do a vesical neck resection by the patient, who had read an article in the newspaper on the subject. It was not a suitable case, the prostate being too large to have this procedure done. He did not do well after the operation. He suffered more than the usual pain, there was more than the usual bleeding, and finally suprapubic pain developed. A suprapubic opening the second postoperative day revealed a prevesical infiltration of urine and pus. He died of shock that night.

The eighth fatality was that of J. W., a man, aged 64, operated on by one of the most competent members of my staff, Jan. 16, 1933. He died that night following and exploratory incision to determine the cause of his great shock.

The last death in this series occurred, Feb. 18, 1933, three days after vesical neck resection for carcinoma of the prostate. Secondary open operation was necessary in this case also, in order to stop hemorrhage and repair a rent in the bladder.

By a review of these deaths it is noted that any kind of complication common to open prostatectomy can and does occur even in very carefully selected cases. Nonfatal complications of all sorts are possible and do occur in this group of patients.

CONCLUSIONS

Vesical neck resection has a definite place in the armamentarium of the profession for dealing with certain types of enlargements at the vesical orifice. In fact, the new instruments recently developed have materially widened the scope of the Young punch. When successful, this procedure is economical for the patient and gratifying to his physician. The field for its employment, however, is limited. It is unwise to attempt this procedure on massive adenomatous prostates. It is particularly illogical and improper to remove partially a prostate filled with pus which is being absorbed because of the fact that the tubules are sealed off, and it becomes a serious focus of infection. One should take a leaf out of the book of knowledge regarding tonsillectomy and not repeat mistakes in this regard.

On the other hand, it is ideal for patients suffering from carcinoma of the prostate, small projections from the floor of the vesical orifice, and fibrous bars.

This operation is far from being an office procedure; the avalanche of statistics seems to indicate that many patients are being operated on who do not need it. It is just as important to safeguard a case suitable for vesical neck resection as any other prostatic case. All the usual preoperative tests and maneuvers for improving the patient's general physical condition should be performed.

Patients on whom vesical neck resection have been performed are subject to all the complications that have occurred in our prostate series.

Our mortality rate is 10.11 per cent in a series of eighty-nine cases, which is approximately the same as that of our suprapubic prostatectomies. The lowest mortality rate, 4.8 per cent, occurs in our series of 535 perineal prostatectomies for benign adenomas.

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ABSTRACT OF DISCUSSION

DR. OMAR F. ELDER, Atlanta, Ga.: A careful rectal and cystoscopic examination gives one an idea as to the size of the prostate. Air cystograms should always be made, for stones have been found in many of these cases and it is well to know this beforehand. Dr. Lowsley states that there is a place for resection and I firmly believe that in 99 per cent of all types of obstruction resection is the key. It is a question of technic and if one knows what one is going into one can relieve the patient of his obstruction. In the case of a very large prostate, such as is rarely found, one can use the loop and remove a portion and a week later do the regular resection. Dr. Folsom likes to remove the whole thing in one bite, which may be better in some cases.

DR. J. R. DILLON, San Francisco: When I began to attend these meetings some fifteen years ago there was generally a yearly battle as to the relative merits of suprapubic and perineal prostatectomy. About the time the old groups decided to pursue their own course in the method each one was particularly trained, a new group of resectoscope operators lined up against the old groups. Allied with this new group of "resectionists" is found an army of commercialists with an array of instruments and electrical units. These allies are reaching the public by sending advertising literature along with reprints, as well as lay salesmen to interview physicians, especially those with a small hospital or connected with an institution that has not installed an outfit. The men in teaching institutions are besought by small town practitioners who want to be taught in from two to ten weeks the simple spectacular operation of taking out a prostate transurethrally. Many of these men do not own and have never used a cystoscope. Urologists have made splendid progress in the last fifteen years in lowering the mortality rate in prostatectomies in both suprapubic and perineal groups. It was learned years ago that any prostatic nodule overlooked in the course of a prostatectomy will enlarge and produce obstruction in from three to six years in an older, more debilitated and more damaged cardiorenal patient. Enucleations *en masse* and much more careful inspection of the prostatic capsule under vision have practically eliminated these secondary prostatectomies, and one can confidently assure the patient that he will live out the remainder of his life with no serious urinary disturbance. In the few instances in which they do come back with a new growth, it is with a carcinoma which has started in the posterior lamella and is never removed in either open or closed methods. There have been localized carcinomas removed in lateral lobes by the open methods. These were undoubtedly cancer cures in many instances and must be reckoned with in the ultimate mortality ratios. Most of the statistics on the resectoscope operations are based on all operations, including contracted bladder neck types. The resectoscope has come to stay as a development of the punch operation pioneered by Young, Caulk, Collings and McCarthy. I shall continue to limit its use to contracted bladder necks and to moderately hypertrophied prostates giving obstructive bladder symptoms, with little or no residual urine, in men who are still sexually active. In such cases I have had a high percentage of gratifying results. But in old men who have a residual urine, and an impaired cardiorenal system, who have to go through a stage of preoperative treatment and run the same operative risks and complications, I cannot see the sense in avoiding the proved permanent result of an open prostatectomy.

DR. N. G. ALCOCK, Iowa City: I would like to invite Dr. Lowsley to the Scientific Exhibit in order to show him the charts and exhibits of every patient operated on. I would like to invite him to Iowa City, to have him go over every case in the hospital. I am sure he would say after seeing them that I would be very foolish to do anything else. The number of cases of prostatic patients that I can handle now is limited to the number of available beds. Previous to resection I was limited to about 100 prostatectomies a year. Now a bed that formerly took care of one patient takes care of four.

DR. O. S. LOWSLEY, New York: I believe every word Dr. Alcock has told us. I wish all of us were as open about statistical reports as our chairman. His results have been spectacular and it was his report at Toronto that rejuvenated me in my dying enthusiasm for this procedure, and I now have eighty-nine cases to report.

LOW BACK PAIN

WITH SPECIAL REFERENCE TO THE ARTICULAR FACETS, WITH PRESENTATION OF AN OPERATIVE PROCEDURE

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Many theories have been presented regarding the pathologic changes that underlie low back pain. The subject is still far from settled, although year by year knowledge of the condition improves. To any one who studies the skeleton, the vertebrae particularly, and their anatomy, the importance of the articular facets in the function of the spinal column must be obvious. Further study of a series of spinal columns will reveal that in many of them are changes around the articular facets which must produce symptoms.

The articular facets must be regarded as the only true joints in the spinal column.[1] As true joints, hyaline cartilage covers their surfaces and synovial membrane lines their articular capsules. This articular capsule is more redundant and loose in the cervical region than in the lower portion of the spinal column. It has seemed to me that many of the aches and pains which are known as "backache" are true pains of the joints. They represent the same type of pain as that seen in arthritis of the knee or hip, and the accompanying changes are characteristic of degeneration or traumatic arthritis. The pains are often static in type; that is, they can be relieved by assuming a certain posture, or they can be greatly exaggerated by assuming other postures. The severe exacerbations of pain sometimes experienced are more like the pain of a "locking" joint than any other type of pain.

The degenerative changes that are characteristically seen in hyaline cartilage may be seen in the articular cartilage of these facets, together with the eburnation of the underlying bony trabeculae. This degeneration may go on to complete loss of the cartilaginous surface,

From the Section on Orthopedic Surgery, the Mayo Clinic.
Read before the Section on Orthopedic Surgery at the Eighty-Fourth Annual Session of the American Medical Association, Milwaukee, June 13, 1933.

1. Cunningham, D. J.: Textbook of Anatomy, New York, William Wood & Co., 1913, p. 307.

and irregular hypertrophy of the margins, similar to that seen in the advanced stages of degeneration or hypertrophic arthritis of other joints. Thus, the setting is present for a syndrome the same as that seen in many cases of hypertrophic arthritis of the hip, knee or other joints.

It must be realized, too, that there is a more or less constant strain on these articular surfaces, particularly those of the lumbosacral articulations. These surfaces act as stabilizers for the entire spinal column. They are so placed as to prevent forward slipping of the

Fig. 1.—Right and left oblique views of lumbosacral joint showing *a*, right lumbosacral articular facet with marginal changes suggesting a fracture, and *b*, left lumbosacral facet with hypertrophic change of traumatic origin.

body of the fifth lumbar vertebra on the sacrum. Any destruction of the integrity of the surfaces under consideration may result in such slipping or in the production of spondylolisthesis. All motions of the spinal column are transmitted to these articular surfaces and even the slightest movement of the lumbar region may result in motion between them. Such movements, if there are arthritic changes in the articular facets, are likely to produce pain. The constant pressure of the surfaces of the facets, one against another, may likewise produce pain, which in many instances is hard to relieve because of the difficulty of getting the surfaces separated by any movement or maneuver whatsoever. The heavy lumbar musculature tends to hold the surfaces firmly against each other, and if spasm is set up in these muscles the surfaces are clamped tighter together.

LITERATURE

Several authors have mentioned the articular facets in the production of the complex of lame back. Goldthwait [2] pointed out the importance of anomalous placement of the facets and considered their relationship to certain cases of pain low in the back. He did not, however, note any changes except anomalous position of the facets, and their occasional dislocation. He seemed to regard the transverse processes as more likely to cause pressure on the nerve roots. Danforth and Wilson [3] have given the most accurate anatomic picture of the lumbosacral joint. They pointed out several important facts: First, the intervertebral foramen between the fourth and fifth lumbar vertebrae is always the smallest; second, the fifth lumbar nerve root is usually the largest; third, the fifth nerve root is directly anterior to the posterior articulation between the fifth lumbar vertebra and the sacrum, and effusion within this joint might easily cause compression, and, fourth, in the anatomic specimens "hyperextension of the spine caused the posterior superior articular facets of the posterior joints to be driven upward toward the inferior intervertebral notches of the vertebra next above and in this way diminished the size of the intervertebral foramen and might conceivably compress the nerve to some extent." The importance of changes in the facets in production of sciatic pain is obvious. These authors referred to the narrow fifth lumbar disk in some of their cases. Ayers [4] pointed out narrowing of the fifth lumbar disk as a cause of backaches and noted that in cases of excessive lordosis the greatest strain is thrown on the articular facets.

Key,[5] in 1924, stated that he regarded strains of sudden onset, low in the back, as true sprains, with tears of the ligaments or articular capsules, and further stated that "the referred pains are perhaps due to irritation of the fourth and fifth lumbar nerve roots by an exudate or synovitis of the adjacent joints."

Putti [6] presented the whole subject of the importance of the articular facets in the Lady Jones Lecture in 1927. He quoted Goldthwait and Danforth and Wilson, and considered anomalies as well as pathologic changes of the articular facets as causes of sciatic pain. He stated that "the diseased joint, by its swelling and deformity changes the shape and capacity of the foramen, thus irritating and compressing the nerve within it." Again, in 1929, Ayers [7] reviewed the subject, pointing out the importance of the narrow fifth lumbar disk and of the facets, and the fact that the nerve root

Fig. 2.—Projected surface of sacro-iliac joint. The level of the lower margin of the sacro-iliac joint runs parallel with the upper margin of the sacrosciatic notch.

passes through the intervertebral foramen between the disk and the facets. Brown [8] noted the changes seen in the relationship of the articular surfaces of the facets

2. Goldthwait, J. E.: The Lumbosacral Articulation: An Explanation of Many Cases of "Lumbago," "Sciatica" and Paraplegia, Boston M. & S. J. **164**: 365-372 (March 9) 1911.

3. Danforth, M. S., and Wilson, P. D.: The Anatomy of the Lumbosacral Region in Relation to Sciatic Pain, J. Bone & Joint Surg. **7**: 109-160 (Jan.) 1925.

4. Ayers, C. E.: Lumbosacral Backache, Boston M. & S. J. **196**: 9-16 (Jan. 6) 1927.

5. Key, J. A.: Low Back Pain as Seen in an Orthopedic Clinic, Am. J. M. Sc. **168**: 526-534 (Oct.) 1924.

6. Putti, V.: New Conceptions in the Pathogenesis of Sciatic Pain, Lancet **2**: 53-60 (July 9) 1927.

7. Ayers, C. E.: Lumbosacral Backache, New England J. Med. **200**: 592-608 (March 21) 1929.

8. Brown, L. T.: Conservative Treatment of Backache, J. Bone & Joint Surg. **14**: 151-164 (Jan.) 1932.

in various postural changes of the lumbar part of the spinal column. Williams,[9] in his description of the clinical picture of a "reduced lumbosacral joint space," or narrowed fifth lumbar disk, referred to the articular facets, although it is difficult to tell from his discussion how important he regarded them as causes of sciatic pain or backache.

THE "FACET SYNDROME"

There is ample evidence in the literature that others have regarded the facets as causes of sciatic pain. I

Fig. 3.—Lumbosacral facet on the right (*a*), with marked hypertrophic changes; *b*, same region after resection of the facet had relieved the sciatic pain. The patient had spondylolisthesis with sciatic pain, and, in spite of excellent bony lumbosacral fusion by bone graft, the sciatic pain persisted.

feel not only that they are causes of sciatic pain, but that they may be causes of lumbosacral pain with or without sciatic pain. Particularly those patients who complain of sudden onset of pain low in the back, brought on by some activity, often trifling in its severity but usually involving a twisting or rotary strain of the lumbosacral region, are, in all probability, usually victims of the "facet syndrome." These patients often present sciatic scoliosis, which may be homolateral, contralateral or alternating. With the onset of sciatic scoliosis, muscle spasm sets in, and this, although splinting in action, forces the irritated surfaces of the facets together more firmly. Until this muscle spasm subsides or some change in position of the surfaces of the facets takes place, as by manipulation, the pain may persist. Actual sciatic pain may or may not be present at once. It often appears later in the disorder to complete the facet syndrome.

In those cases in which the roentgenogram reveals narrowing of the fifth lumbar intervertebral space, with consequent flattening of the disk, much abnormal strain must be thrown on these facets. It is obvious that, with narrowing of the disk, overriding of the surfaces of the facets must take place. This can be demonstrated by oblique views of the lumbosacral region. With this abnormal contact, traumatic arthritis is likely to be set up, which in time must produce symptoms not only of lumbosacral pain but of sciatic pain as well. In fact, the sciatic pain in these cases seems more likely to be caused by pressure on the nerve or nerve sheath exerted by the facet than by the intervertebral disk. It is possible, too, that the surfaces or margins of the facets may be fractured by undue stress or strain. In some cases seen at the Mayo Clinic (fig. 1) it has been possible to obtain roentgenologic evidence of such marginal changes in these articulations as could come about only through fracture of the margin of the joint, such as can be seen occasionally in any of the smaller joints. The mechanical strain placed on these surfaces when the spinal column is forcibly hyperextended must be great; such traumatic changes probably are present in many more instances than heretofore have been recognized.

ROENTGENOLOGIC EVIDENCE

The satisfactory demonstration of changes in the articular facets has not been possible until recently. Kirklin and I[10] have presented a method of demonstrating these changes which seems to us much more satisfactory than any method heretofore used. Anteroposterior views of the lumbar and lumbosacral portions of the spinal column may show the facets of the upper lumbar vertebrae clearly, but the facets between the fifth lumbar vertebra and the sacrum are usually so placed that they do not show clearly in an anteroposterior view. The same is often true of the facets between the fourth and fifth lumbar vertebrae. Stereoscopic roentgenograms of this region, however good, often leave one dissatisfied as to the changes that may have taken place in the facets. The views already referred to as oblique views, or three quarter views, show the joint space between the articular facets clearly. In instances in which there is anomalous place-

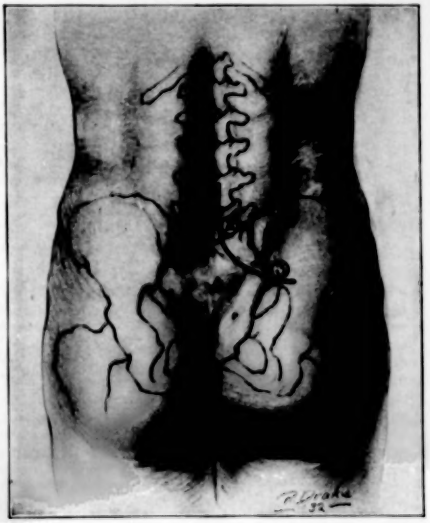

Fig. 4.—Characteristically tender points of the lumbosacral region: 1, lumbosacral arthritis with narrow disk; 2, the same with predominant changes in the facets; 3, sacro-iliac tenderness. The curved line indicates the usual incision for combined lumbosacral and unilateral sacro-iliac fusion.

ment of structures little can be told even from oblique views, but when the structures are in their usual situation one can accurately determine the presence of irregularities in the joint space as well as changes along the margins of the facets.

9. Williams, P. C.: Reduced Lumbosacral Joint Space, J. A. M. A. 99: 1677-1682 (Nov. 12) 1932.

10. Ghormley, R. K., and Kirklin, B. R.: The Oblique View for Demonstration of the Articular Facets in Lumbosacral Backache and Sciatic Pain, to be published.

TREATMENT

Treatment of this condition may be said to fall into two categories. If the condition has been present a short time only, and if no treatment of any consequence has been given, conservative measures, such as recumbency, with or without traction on the lower extremities, physical therapy, and possibly epidural injection of anesthetic substances are advocated. This entire subject has been covered in a recent article by Craig and

Fig. 5.—Combined lumbosacral bone graft and sacro-iliac fusion operation showing the lumbosacral bone graft in place. The Smith-Petersen fusion of the sacro-iliac joint, showing exposure of the joint with removal of its cartilaginous surfaces: *a*, the piece removed to expose the sacro-iliac joint; *b*, position of plug and lumbosacral bone graft from posterior iliac crest; *c*, the plug countersunk.

me.[11] Our paper dealt particularly with sciatic pain. In many of the cases considered in the present article, sciatic pain is the main symptom, so that cases of the sort considered here made up a fairly large proportion of the cases studied by Craig and me. If conservative measures do not bring relief, it is necessary to choose one of the following: further conservative treatment; more radical measures, such as manipulative procedures or long recumbency in plaster casts, or ultimately radical operation. I feel that a comparatively small group of patients are amenable to surgical treatment. One can pretty safely assure the patient that in time he will be relieved by conservative types of treatment. But in many instances the period of time over which the patient may suffer from recurrent attacks of low back pain, with or without sciatic pain, is so prolonged as to make surgical procedures of real value, provided they leave the patient sufficiently improved to justify them.

It has been my experience that younger persons who have well established recurrent backache of this type are likely to have a very prolonged period of recurrent attacks. Among older persons, the tendency seems to be toward gradual lessening of the severity and frequency of the attacks, probably because of the natural process of ligamentous and articular change which accompanies age. Hence, it is best, usually, to select only younger patients for surgical treatment.

Failure of conservative treatment alone should not be an indication for operative treatment in these cases. In a general way, it may be said that operation is justified only in the following circumstances:

1. The patient must have persistent pain low in the back, with or without sciatic pain or recurrent attacks, over a period of months.

2. The pain must be consistently localized over a definite area, with tenderness on pressure over either the lumbosacral joint—that is, the space between the fifth lumbar spinous process and the first sacral spinous process, or laterally in the region of the lumbosacral articular facets—or he must have tenderness over one or both sacro-iliac joints. This tenderness is localized along the upper border of the sacrosciatic notch, which is directly over the sacro-iliac joint (fig. 2). Such tenderness may be found also in the presence of lumbosacral lesions, in which event pain along the superior gluteal nerve is common. This makes the differential diagnosis between these conditions very difficult at times.

3. Narrowing of the disk between the fifth lumbar vertebra and the sacrum must be demonstrated in the lateral roentgenogram.

4. Obliterative or destructive changes in the intervertebral articulations must be demonstrated by the oblique roentgenograms of the lumbosacral region.

5. The central nervous system should have been examined and found negative, except for such evidence of irritation of nerve roots, or of pressure on them, as can be noted in many of these cases.

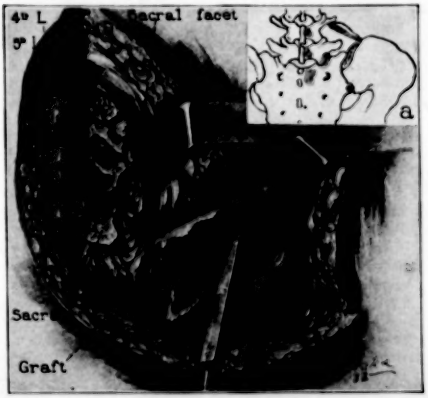

Fig. 6.—Preparation of the bed for the lumbosacral bone graft and the method of removal of the graft. A portion of the articular facet has been excised to break the bony wall of the intervertebral foramen.

With these conditions satisfied, one may consider operative treatment with a fair assurance of success, but the importance of the presence of these factors cannot be emphasized too much. If the pain low in the back is caused by disturbances in either the lumbosacral or sacro-iliac joints, or both, fusion of these joints should relieve the pain. If the sciatic pain is the result of diminution in the size of the foramen of exit of the

11. Craig, W. McK., and Ghormley, R. K.: The Significance and Treatment of Sciatic Pain, J. A. M. A. **100**: 1143-1149 (April 15) 1933.

fifth lumbar nerve root, enlargement of that foramen should relieve the pain.

OPERATION

The type of operation chosen in these cases is, of course, important. Production of lumbosacral ankylosis by bone graft or bony fusion cannot always be depended on to relieve these patients. In some cases even in which there was unquestionably excellent bony fusion or ankylosis, sciatic pain persisted; this, in spite of the fact that apparently the lumbosacral lesion was the original cause of the backache (fig. 3). Removal of the facet resulted in relief of the sciatic pain. Such procedure alone can rarely be risked as a cure for sciatic pain. I [12] have reported a case in which removal of a portion of the articular facet, thus enlarging the foramen of exit of the nerve, resulted in cure of severe sciatic pain. Recently the patient wrote that he had remained well. The day may come when it will be possible to select all the patients whose trouble lies solely in the facet and who can be cured by its partial or complete removal. However, in the light of present knowledge, bony lumbosacral ankylosis must be produced, and, at the same time, sufficient bony and cartilaginous material resected from one facet or from both to remove a portion of the bony wall of the foramen through which the nerve root passes. Perhaps in many cases ankylosis of these joints will produce the desired result. I believe this is true in those cases in which backache only is the predominating symptom, but if sciatic pain is present in addition to the backache, in most instances enlargement of the foramen is essential, and this can be most easily accomplished by excision of the articular facet.

A review of the literature on operative treatment of low back pain discloses that seven distinct operative procedures have been in more or less constant use. They may be grouped as lumbosacral or sacro-iliac operations or as combined fusion operations. The lumbosacral operations most often used are the Hibbs operation, the trisacral fusion operation of Chandler, and the many modifications of Albee's application of bone transplants from the tibia. Smith-Petersen, Campbell, Gaenslen and Verrall have devised operations designed to stabilize the sacro-iliac joint. All these operations have their advocates.

If operative treatment has been selected, the attempt should be made to determine exactly whether the pain is sacro-iliac or lumbosacral. Criteria for selecting patients for operative treatment have been laid down in this paper. If the symptoms cannot be satisfactorily localized to one joint, two or even all three joints may be treated by operation. In examining patients there are may helpful tests and signs; notably, raising of the straight leg, flexion of the thighs on the abdomen, Goldthwait's sign, Gaenslen's sign, and so forth. However, no sign is so consistently informative as elicitation of tenderness on point of pressure. It is of value to be able to demonstrate this tenderness, consistently localized, on several examinations at varying intervals. Any case in which tenderness shifts is not a case for operative treatment.

When the joints that are to be fused have been determined, the incision indicated in figure 4 is employed, except in cases in which both sacro-iliac joints, as well as the lumbosacral joints, are to be subjected to operation. In these cases a transverse incision is used, curving upward, starting at one sacrosciatic notch and extending across the lumbosacral region to the opposite notch. With the exposure of the lumbosacral area, either the surfaces of the facets are excised or fused, and the laminae and spinous processes of the fifth lumbar vertebra and first and second sacral segments are freshened. Then, starting at the posterior superior spine of the ilium, the iliac surface is denuded of periosteum and muscular attachments are denuded, down to the superior margin of the sacrosciatic notch. Fusion of the sacro-iliac joint is then effected after the method of Smith-Petersen [13] (fig. 5). Finally a graft of bone is taken from the posterior aspect of the iliac crest, including most of the posterior superior iliac spine; this graft is placed in the bed prepared for it, between the fifth lumbar vertebra and the sacrum (fig. 6). Such a graft, I think, brings about ankylosis much more quickly than those taken from the tibia. Experimental work, as yet not published, has proved this.

The patient is kept on a firm bed, and a Bradford frame is used. A scultetus binder is the only device for fixation applied over the dressing. After twenty-four hours the patient's position is changed from prone to supine every six hours. After five weeks he is allowed to turn himself, and after six weeks he is allowed to be up, wearing a wide canvas body support or corset. Limited activity for two to three months more is prescribed; roentgenograms are taken at the end of four months from operation.

SUMMARY

Pathologic changes in the articular facets underlie many cases of pain low in the back, particularly those in which are present the symptoms here referred to as the facet syndrome. Proof of these changes is in many instances difficult to secure, but much aid in establishing such a diagnosis will be derived from the use of oblique roentgenograms of the lumbosacral region. Before operative treatment is decided on, the surgeon must be certain of the joints to be stabilized or the result may be poor. Combined lumbosacral and sacro-iliac fusion, such as has been described, has proved much more satisfactory than any other type of operative procedure.

12. Ghormley, R. K.: The Operative Treatment of Painful Conditions of the Lower Part of the Back, Proc. Staff Meet., Mayo Clinic **6**: 112-113 (Feb. 25) 1931.

13. Smith-Petersen, M. N., and Rogers, W. A.: End-Result Study of Arthrodesis of the Sacro-Iliac Joint for Arthritis—Traumatic and Non-traumatic, J. Bone & Joint Surg. **8**: 118-136 (Jan.) 1926.

The Physiognomy of Disease.—There is a very genuine study in what may be called the physiognomy of disease. Among the more striking and specific physiognomies we include the mitral facies, with its malar hyperemia and dark crimson lips, its varying tints of purple and, when failure is advanced and the liver engorged, its underlying icterus. The drawn, pale, anxious, gray-lipped hippocratic facies of peritonitis, with "sharp nose and hollow eyes," is fortunately much rarer than it was, thanks to the surgeons. And so is the risus sardonicus of tetanus. The broad, thick-lipped, impassive face of myxedema, with the cheeks tinted "a delicate rose-purple," as Gull described it, a slight underlying waxiness, a smoothness of the skin, and the receding hair margin and scanty eyebrows, is very characteristic, but I have known it, when inspection was too superficial, mistaken for that of mitral disease, nephritis and pernicious anemia. The anxious face of hyperthyroidism, with prominent eyes and bulging neck, presents no difficulties in the well developed case, but I have often had cases referred to me in which the cause of a tachycardia or a breathlessness, a nervousness, or a loss of weight had passed undetected because slight and early eye signs or the fine tremor of the extended fingers had not been observed.—Ryle, J. A.: The Training and Use of the Senses in Clinical Work, *Guy's Hosp. Gaz.* **47**:421 (Oct. 28) 1933.

TRAUMATIC BACKACHE

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Traumatic backache, although not an ideally scientific term, describes clinically a condition familiar to every orthopedic surgeon. A great many articles have been written about backache, but much of the literature is of a general nature without particular regard to specific points of diagnosis and treatment. Since it has been found that a high percentage of these traumatic backs recover under a definite yet simple although perhaps not an original method of handling, it would seem worth while to make this report.

In traumatic back injuries, wherein the predominating symptom is that of pain, there may be a division into three or possibly four classes:

First, those occurring from traumatism on top of a pre-existing arthritis of the spine and pelvis.

Second, those due to traumatism of the soft parts of the back, such as muscle, tendon, ligamentous or periosteal tissue.

Third, cases with a predisposition to injury due to faulty posture.

Fourth, cases caused by occupational strain—such as heavy lifting.

This type of traumatic backache has been estimated by Miltner and Lowendorf,[1] in a summary of 2,050 cases of lower back pain, to be present in 30 per cent of this number.

It is assumed that not all traumatic back cases will necessarily fall under one of these specific headings. Many cases may be a combination of one or two or even three of these classifications. It is important, however, that the predominating symptoms be brought out and properly classified so that suitable treatment may be instituted. It is recognized, for example, that traumatism may stimulate arthritis of the spine, and it is also conceded that a patient with a traumatic back having predisposing arthritis symptoms is also retarded in recovery if there is an attendant faulty postural strain.

Out of a hundred cases of traumatic backache, Yeoman [2] reports seventy-seven men as against twenty-three women. The average age was 44; the youngest patient was 18 and the oldest was 72. In my series of fifty cases of backache caused by traumatism there were twenty-four men and twenty-six women. The average age was 38.1; the youngest was 17 and the oldest was 68 (table 1).

In carefully studying the anatomy of the lower part of the back, it would seem from a purely mechanical standpoint that the method of construction is erroneous, for it would seem that nature has put the keystone of the arch of the lower part of the back upside down and has allowed the entire load to come on this inverted keystone. On the other hand, it is known that the lower part of the back is a shock absorber, and, if taken from this standpoint, it is seen that the pelvis and lower part of the spine are ruggedly built. According to Chamberlain's [3] method of computation, the male pelvis is normally capable of only one-half to one-third the mobility of the normal nonpregnant female pelvis. He points out, however, that, when involved, the male pelvis is much more troublesome and the discomfort is more marked than that of the female subject. It is quite obvious that, owing to occupation and to increased opportunities for traumatism, traumatic backache is more prevalent in the male.

As a general thing, according to Ryerson, the younger patients are more apt to have mechanical instability, while the older patients have an arthritic process, which renders the joints more vulnerable to traumatism.

In a true case of arthritis of the spine, in which there has been no history of injury, there is often a history of pain beginning in the lower part of the back and referred to the buttocks and thighs. As a rule there is a loss of the normal anterior-posterior lumbar curve, and there is usually definite limitation of the normal motion of the spine. Often there is attendant muscle spasm and neuritic signs. The diagnosis may usually be made from these symptoms alone, but it is always more conclusive to have a roentgenogram. This usually shows definite hypertrophic bone changes.

In traumatic backache, the seriousness of the condition may grade all the way from a soft tissue strain up to an actual fracture of the vertebral bodies or contiguous structures. The serious type of fracture is, of course, not to be included in this paper, but slight cases of check-fractures or unrecognized fractures brought out by carefully taken roentgenograms are rather common and are definitely contributary to the disability of the patient.

Sprains of the back in varied states of severity and symptoms are very common. The symptoms may be at once present, or they may come on some time after the accident. Their usual causes are violence, coming from an extraneous source or the overstretching of a muscle or tendon, due to unnatural strain or stress. These traumatic back injuries are most frequent in the lumbar region. Second in frequency is the cervical spine, then the dorsal spine, which is the least flexible and the least liable to injury.

TABLE 1.—*Fifty Cases of Backache Caused by Traumatism*

Number of males	24
Number of females	26
Average age	38.1
Number under 20	4 per cent
Number between 20 and 40	62 per cent
Number between 40 and 50	18 per cent
Number over 50	16 per cent
Results of nonoperative treatment:	
Complete relief	66 per cent
Partial relief	34 per cent
Results of operative treatment:	
Complete relief	8 cases
Relief from pain, refuses to work	1 case
Average duration of symptoms	30 months
Average duration of treatment before being relieved	6.37 months

The symptoms involved in a case of traumatic backache are, first of all, pain, with usually a history of a blow, a strain or a fall. If the condition is primarily muscular, the pain is intensified when that group of muscles or single muscle is strained. This may be brought out by the fact that, when the back is moved in one direction or another, the pain is increased, and usually there is attendant muscle spasm. In most cases, standing is very painful; in still other cases, it is impossible for the patient to remain seated, so that in any position that he may assume he is most uncomfortable. Often there is discomfort following coughing or sneezing. Riding in an automobile is many times unbearable.

Read before the Section on Orthopedic Surgery at the Eighty-Fourth Annual Session of the American Medical Association, Milwaukee, June 13, 1933.

1. Miltner, L. J., and Lowendorf, C. S.: Low Back Pain: A Study of 525 Cases of Sacro-Iliac and Sacrolumbar Strain, J. Bone & Joint. Surg. **13**: 16-28 (Jan.) 1931.

2. Yeoman, W.: Relation of Arthritis of Sacro-Iliac Joint to Sciatica, with Analysis of 100 Cases, Lancet **2**: 1119-1122 (Dec. 1) 1928.

3. Chamberlain, W. E.: X-Ray Examination of Sacro-Iliac Joint, Delaware State M. J. **4**: 195-200 (Sept.) 1932.

This pain may be localized or referred. In some cases, the pain is severe enough to resemble a true case of sciatic neuritis, but the condition may be differentiated by bringing out the fact that the pain is rarely that of the peripheral nerves but rather along the course of the distribution of the nerve roots.

Smith-Petersen [4] classifies the local site of pain as in table 2.

TABLE 2.—*Site of Pain*

	Per Cent
The region of the inferior sacro-iliac ligaments and the greater sacro-iliac notch	100
Subjective areas of radiation:	
Posterior aspect of the thigh	89
Posterior aspect of the leg	81
Along the course of the superior gluteal nerve	25
Lower mesial aspect of thigh	12

He further reports areas of tenderness as in table 3.

TABLE 3.—*Areas of Tenderness*

	Per Cent
Inferior sacro-iliac ligaments and greater sciatic notch	100
Distribution of subgluteal nerve	23
Sciatic nerve trunk	27
Lumbosacral region	3.2

In most low backaches caused by traumatism, in addition to the pain there is a definite pelvic list or attitudinal posture (fig. 1). The pelvis appears more prominent on one side than on the other. As a rule, the list is away from the side affected. In Smith-Petersen's group there was a pelvic list in 72 per cent of the cases, and of this number the list was toward the side of the lesion in 32 per cent and away from the side of the lesion in 40 per cent of the cases. In addition to this symptom there is usually referred pain down the posterior aspect of the thigh on the side opposite the direction toward which the pelvis lists.

With the patient standing in the position assumed in figure 1 there is an apparent shortening of the extremity on the side toward which the pelvis is listing. Almost all directions of back bending are limited, but particularly in a direction away from the side of the pelvic list. Usually the straight leg raising test as described by Goldthwait,[5] when applied on the concave side of the pelvic list, is decidedly limited and causes pain over one or both of the sacro-iliac joints. This pain may sometimes be localized over an area parallel to the lumbar spine, extending laterally, 2 or 3 inches from the midline of the spine.

There are a number of tests devised by different authorities which definitely help, more or less, to localize the site of the low back pain. These tests are important in the differential diagnosis. Among these is forcible compression of the sacro-iliac joints, which will often elicit pain in the affected joint. This can be done either by direct pressure of the examiner's hands over the crests of the ilium or by placing the examiner's knee over the sacrum and forcibly pulling backward over the region of the anterior superior spines.

Smith-Petersen especially emphasizes the symptoms elicited in bending over while the patient is standing, sitting or lying. He emphasizes the importance of these various positions as a means of differentiating between lumbar and sacral conditions. With the patient standing, the back is first flexed, then the pelvis is tilted until the hamstrings become tight. The site of the pain will, as a rule, be easily localized by the patient. In the lumbosacral case, forward bending of the back is possible but the tilting of the pelvis is resisted. In the sitting position, the patient with a sacro-iliac joint trouble can usually bend forward quite easily. The same may be said of flexion with the patient lying on his back.

Gaenslen advocates the following procedure: With the patient lying flat on his back, the thigh and knee of one lower extremity are fully flexed. This extremity is held in this position by the patient. The other lower extremity is held fully extended, and pressure is made on the knee. Pain will be demonstrated in the affected sacro-iliac joint.

The Laqueur sign consists of forcing the leg into flexion, abduction and outward rotation, causing pain in the sacro-iliac joint involved.

In Yergason's [6] chair test the patient is asked to step up onto a chair, with the unaffected leg and without aid. His attention is taken up with the act and if he is malingering he may complain of pain in that leg, whereas a patient with real sacro-iliac joint trouble cannot step from the affected extremity or sacro-iliac joint without pain.

In cases of traumatic arthritis, unless there has been a preexisting arthritis, the roentgen examination is usually negative. Many times there is thickening of the soft tissues about the sacro-iliac joints, and pressure in this area causes pain. If the condition is unilateral, and this many times is the case, the test brought out by Carnett [7] can be satisfactorily applied. He believes that the pinching of a liberal fold of skin and fat between the examiner's thumb and one or two fingers is the best method of examining for tenderness. In a normal individual the maximum pinching pressure causes only slight discomfort and not actual pain. In tender areas a mild pinch may cause severe pain. Patients cannot estimate the force of the applied pinch, and their erratic responses quickly reveal the malingerer to the examiner.

Fig. 1.—Right pelvic list.

In the great majority of cases of back injury, pain and tenderness involve one or both sides of the lowermost part of the abdomen. This region is supplied by the hypogastric and ilio-inguinal nerves. In addition to supplying the lower part of the abdomen, both these nerves send sensory filaments to the buttock. The ilio-inguinal nerves supply an area about 1½ inches in width, superficial to and parallel with Poupart's liga-

4. Smith-Petersen, M. N.: Clinical Diagnosis of Common Sacro-Iliac Conditions, Am. J. Roentgenol. **12**: 546 (Dec.) 1924; Routine Examination of Low Back Cases with Particular Reference to Differential Points Between Lumbosacral and Sacro-Iliac Regions, J. Bone & Joint Surg. **6**: 819 (Oct.) 1924.

5. Goldthwait, J. E., and Osgood, R. B.: A Consideration of the Pelvic Articulations from an Anatomical, Pathological and Clinical Standpoint, Boston M. & S. J. **152**: 593, 1905.

6. Yergason, R. M.: Diagnostic Sign in Examination of Affections of the Sacro-Iliac Joint; Chair Test, J. Bone & Joint Surg. **14**: 116-117 (Jan.) 1932.

7. Carnett, J. B., and Bates, W.: Railway Spine, S. Clin. North America **12**: 1369-1386 (Dec.) 1932.

ment, and likewise a V-shaped area at the uppermost inner aspect of the thigh. If any one of these areas is tender, all four will be found to be hypersensitive. Spontaneous pain is present only in the abdominal area in the majority of patients, but a small percentage of patients may complain of pain in one of the three other areas. Very few patients have pain in all four areas. The malingerer is not familiar with the interdependence of tenderness in these four areas and the finding of tenderness in all four areas, even when pain is present in only one, promptly establishes the patient's claim as real and not fictitious.

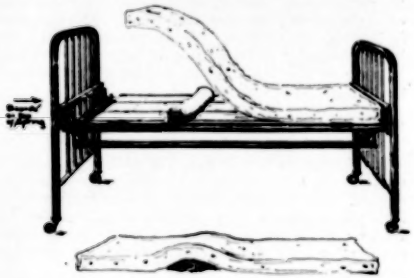

Fig. 2.—Method of making fracture bed with hyperextension roll.

It must be remembered that, in injuries to the back, the condition may be attended by symptoms that are more widespread, serious and undermining in character than those injuries attendant to any other joint. For example, an injury to the knee may be attended by localized swelling and pain and limitation of motion, but under routine treatment of rest and, later on, heat and massage, the joint symptoms usually subside and the patient is able to get back to his former duties without incidental interruption. In the back, such a convalescence is not the routine program. A similar injury affecting the back may be attended by a great deal of pain and limitation of motion. Such a condition rapidly assumes a chronic state, and these cases commonly appear in lawsuits. One has only to "listen in" at the bar to realize just how little is known of a specific nature about this condition.

In the differential diagnosis of traumatic arthritis of the back, there are certain conditions which must be eliminated first. One of the most important things to eliminate is a fracture, and this can be done definitely by means of a clear-cut roentgenogram. There may have been a preexisting hypertrophic arthritic condition, and this also may be eliminated by means of a roentgenogram. The fact that there has been a preexisting arthritis of the spine does not preclude the diagnosis of traumatic arthritis of the back, because, although there may have been a bony hypertrophy, the traumatism will have caused an acute arthritis on top of a chronic condition, affecting the soft tissues, such as the periosteum and surrounding tendons and muscles, in such a way as to produce a localized inflammation with the symptoms previously described.

The treatment in the case of traumatic arthritis of the back should be specific and definite and follow a regulated course.

The prognosis as to recovery of these backs should be as good as it is in other joints, provided the attending conditions that may contribute toward the physical observations are eliminated. Foot strain is one of these contributing factors, and support should be prescribed when indicated. It is important to eliminate focal infection as a factor. There is little need of bailing out the boat unless the leak can first be stopped.

So far as direct treatment is concerned, manipulation of these backs has been done by several well known men. Ryerson states that so many patients have reported immediate relief after manipulations that their worth cannot be discounted. The most common method is that described by Baer [8] and is done under an anesthetic with the patient flat on his back: The leg is extended on the thigh, and the lower extremity, moving as a unit, is forcibly flexed at the hip.

TECHNIC OF TREATMENT

The following method of treatment has met with an appreciable amount of success:

First of all, the patient is placed on a fracture bed, preferably in a hospital. Such a bed may be made by taking three boards, 10 inches wide, seven-eighths inch thick and 5 feet 10 inches long, fastened together side by side by means of two cross cleats. This board arrangement is then placed lengthwise on the springs of the bed, and the mattress is placed on top of the boards (fig. 2). This will make a bed with firm and positive support. The foot of the bed should then be raised 6 inches from the floor. Buck's type of extension should be applied to both legs. In the case of an adult female, an 8 pound weight is used on each leg. In the case of an adult male, a 12 pound weight is used. Instructions are given to the effect that if the patient is unusually restless, these weights may be raised for half an hour from time to time.

The patient is allowed to turn on his side for a change of position, but for the most part he is urged to remain on his back, in order to get the maximum amount of positive support and immobilization. Under no circumstances except for unusual conditions is the patient allowed bathroom privileges. This position is maintained for a period of two weeks. At the end of this time a plaster-of-paris cast is applied with the patient resting on a modified Goldthwait hyperextension frame (figs. 3 and 4). The cast is spical and extends from the armpits down to the knee on the side of the referred pain. By holding the back in hyperextension, the maximum amount of immobilization is obtained and the position acquired while the patient has been lying in bed is approximately maintained.

Fig. 3.—Modified Goldthwait hyperextension.

When the patient has become partially accustomed to the cast, he is allowed out of bed for a limited time; these periods of freedom are gradually increased as the patient becomes stronger. The cast is kept on for two weeks, and in some very severe cases the time is extended to three weeks. The cast is then removed and the back is strapped with adhesive tape. The back brace or corset made from measurements previously taken is applied over this strapping. The adhesive tape is allowed to remain on for four or five days and is then reapplied. A baking and light massage is given between strappings. At the end of two weeks the adhesive tape is finally removed and mild exercises are begun. These exercises are gradually increased in severity and scope.

8. Baer, W. S.: Sacro-Iliac Strain, Bull. Johns Hopkins Hosp. 28:159 (May) 1917.

The patient should continue to sleep on fracture boards similar to those used in the hospital for at least six to eight months.

There are certain cases of backache which will not respond to this or any other form of conservative treatment, and it is not advisable to persist in such treatment indefinitely. An operation designed to fuse the bony site of the localized back pain must be considered.

The Smith-Petersen operation is perhaps the most commonly known. This consists in the removal of a rectangular piece of bone crossing the ilium and sacrum and wedging the sacro-iliac joint. This joint is destroyed by curettage or erosion, and the rectangular piece of bone is wedged back in such a way as to cross the joint with cancellous bone. The countersunk block is further secured, and osteogenesis is promoted by turning down flaps of bone from the edges of the window.

Gaenslen advises the division of the posterior third of the ilium into an outer leaf, which is reflected laterally with the muscles attached, and an inner leaf which remains standing. A triangle is marked out on the remaining leaf within the articulating area of the sacro-iliac joint. The joint is eroded, bone fragments are packed into the triangle, and the outer leaf of bone is replaced and sutured.

Campbell [9] advocates an extra-articular fusion, in the belief that such an operation is less likely to lead to infection.

The fusion of one sacro-iliac joint often does not entirely relieve the patient of pain, and the fusion of both the sacro-iliac joints as well as the lumbosacral junction has been found necessary in not a few instances. This operation is done through three separate incisions, one over each of the sacro-iliac joints and one over the lumbosacral junction. The technic is that recommended by Smith-Petersen. The graft used over the lumbosacral junction is an osteoperiosteal graft, taken either from the crest of the ilium or from the flat internal surface of the tibia.

After operation these patients are placed on a Bradford frame. No cast is applied. They are kept in bed for two months. At the end of this period they are given a brace and allowed out of bed gradually. The postoperative care relative to physical therapy, exercises and the like is much the same as that outlined for the conservative treatment of traumatic backache. The number of patients requiring operation has been found to be comparatively small, for, if the conservative treatment is carried out conscientiously, many of the cases in which it is anticipated that an operation may be necessary will respond so well as to make an operation superfluous. In my series of traumatic backs only nine patients came to operation.

CONCLUSION

My reason for outlining a definite program of treatment for traumatic backache is that the response of and relief to the patient has been extremely gratifying.

REPORT OF CASES

CASE 1.—Miss M. R., aged 54, seen in February, 1931, complained of pain in her back which she had had since January of that year. The pain came on suddenly while the patient was doing esthetic dancing. She was in bed for a week. She saw an osteopath, who said there was a partial slipping of one of the vertebral bodies. She had light treatment and the back was manipulated, but at the time of this treatment the pain was much worse.

Physical examination revealed that there was a definite pelvic list to the left with an attendant scoliosis. All back motions were limited. The Lasègue sign was one-half normal and painful. The patient had had a recent tonsillectomy. The pelvis had been reported normal and she had had a recent dental examination.

She was hospitalized on a fracture bed with traction on both hips. This treatment was followed by the application of a cast, and following this she had strapping of her back, wore a belt, and had baking, massage and exercises. Active treatment was kept up for seven months and then she was shown exercises which she did faithfully.

Examination in February, 1933, revealed that she had no back deformity and no pain. She is able to do her regular work and to continue her esthetic dancing. The patient was dismissed as having recovered.

CASE 2.—Mrs. P. C., aged 44, seen in January, 1930, complained of pain in the back which she had had for three weeks, referred down her left thigh and leg. The pain came on suddenly as a result of a strain from lifting. She had had local applications of heat and local massage. She had had recent dental attention. There was no tonsillitis, and examination revealed normal tonsil tissue.

Physical examination revealed a positive Lasègue sign on the left. There was a definite pelvic list to the left and all back motions were definitely limited.

The patient was hospitalized on a fracture bed with traction on both legs. Following this treatment a cast was applied. After the removal of the cast a corset back brace and strapping were applied. Physical therapy was carried on for a time. The back improved but later on began to get progressively worse. Six months after her first visit her back was fused, the Smith-Petersen technic being used to fuse both sacro-iliac joints and the lumbosacral junction. She had an uneventful convalescence.

Fig. 4.—Patient on hyperextension frame ready for application of a cast.

Examination made in February, 1933, showed that there was absolutely no pain in the back and there was normal motion. She was able to follow her regular occupation as a housewife.

CASE 3.—H. B. R., a man, aged 27, seen in May, 1931, complained of pain in the back referred to the right hip and right lower extremity. The patient had had a tonsillectomy two weeks prior to this examination. Pain came on following an injury due to a strain while working on a building.

Physical examination showed a pelvic list to the right with a resulting scoliosis. There was a positive Lasègue sign on the right.

The patient was placed in the hospital on fracture boards with traction to both legs. Following this, a cast was applied and then a corset brace. He was shown exercises and given physical therapy. The back did not improve as rapidly as was anticipated. He consulted another orthopedic surgeon and had the lower extremity manipulated. His back still continued to ache. The pelvic list became worse so that in April, 1932, the back was fused, the Smith-Petersen technic being used and both sacro-iliac joints being fused as well as the lumbosacral junction. He made an uneventful recovery.

Examination made in April, 1933, revealed that his back motions approach normal. He has absolutely no pain, and he has returned to work.

CASE 4.—Mrs. K. P., aged 50, seen in April, 1930, complained of pain in her back, running down the back of her right thigh and leg. She had had this pain for five months, and it had

9. Campbell, W. C.: Operative Measures in the Treatment of Affections of the Lumbosacral and Sacro-Iliac Articulations, Surg., Gynec. & Obst. 51: 381 (Sept.) 1930.

come on suddenly as the result of a fall. She had had osteopathic treatment and had been in bed. Her teeth had been extracted and she had no history of tonsillitis.

Physical examination revealed that she had a pelvic list to the right. All back motions were limited. She had a positive Lasègue sign on the right.

The patient was placed in bed on fracture boards with traction to both legs. Later a cast was applied. Following the removal of the cast a corset brace was applied and she was instructed in the use of baking and massage. Her convalescence was slower than usual, but at the time of the last examination, which was in March, 1931, she was able to do all her housework. There was no back deformity, no pain and no limitation of motion.

CASE 5.—M. S., a man, aged 28, seen in October, 1930, complained of pain in the back, running down the posterior surface of the left thigh. This came on as a result of an accident four years prior to this examination. He had had his tonsils out and his teeth had been recently examined.

The patient stood with a definite pelvic list to the right. All back motions were limited. He had a positive Lasègue sign on the left and he stood with pronation of both feet.

He was equipped with supports for his feet. He was hospitalized on fracture boards with traction to both legs. Later a cast was applied. On removal of the cast he was fitted with a back brace. He was given exercises, baking and massage. Later he went South for some sun exposure. He continued to sleep on fracture boards at home.

In September, 1932, when examined he had no pain. He had returned to work as an automobile salesman and had no back deformity.

CASE 6.—D. G., a man, aged 24, seen in May, 1929, complained of pain in the back coming on as a result of an automobile injury. He had been hospitalized prior to this examination.

Physical examination revealed a definite pelvic list to the right with limitation of all motion of the back. The straight leg-raising test was limited on the left. His feet were slightly pronated.

The patient was placed in bed on fracture boards with traction to both legs. Later a cast was applied and following the removal of the cast a pelvic back brace was fitted. He was given exercises, baking and massage and at the time of his last examination in February, 1933, he had absolutely no pain and had returned to his former occupation as a milk carrier. There was no deformity.

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ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. GHORMLEY AND JEPSON

DR. HENRY W. MEYERDING, Rochester, Minn.: I should like to say a few words which I hope will be of service to general practitioners. When examining injured backs, the first essential is to disrobe the patient, so that careful inspection and palpation can be carried out. The patient then should be made to try to bend forward, backward, to the right and to the left, with the knees and hips stiff, while the hands of the examiner palpate for muscle spasm, deformity and tender areas. Formerly, anteroposterior roentgenograms of the spine were considered adequate, but for some years my colleagues and I have felt that lateral views are of great importance. Impacted fractures, spondylolisthesis, and injury to the intervertebral disks have been much more readily detected in lateral views. As was shown so expertly in the slides presented by Dr. Ghormley, another aid is available in the three-quarter roentgenograms, which reveal the articular facets and sacro-iliac joints so well. In classification, Dr. Jepson might well include a group of congenital anomalies which exist in the lumbosacral region, and which are associated with traumatic backache. In my recent studies of spondylolisthesis I was able to illustrate a great number of such deformities, which result in weakness of the lumbosacral joint when stress and strain on this region take place, giving rise to symptoms of medicolegal importance. The unrecognized compression fracture seen to occur so frequently from jars and jolts incurred in modern fast automobile driving must also be considered. Hernia of the nucleus pulposus and injury to the intervertebral disks are observed with increasing frequency in these cases of traumatic spine. Physicians must always bear in mind as a complication of trauma the possibility of malignancy, metastatic or primary, as a cause of backache, especially among elderly patients. I have seen injuries apparently incurred in industry, diagnosed as traumatic backache, which ultimately proved to be the result of malignancy. One should be extremely careful when expressing an opinion that a person is malingering, for it has been my experience in such cases occasionally to find evidence of fractures, arthritis or metastasis. In persistent cases of sciatica or numbness following injury, even though there is evidence of spondylitis or arthritic changes in the spine, it is well to have a neurologic examination so as to rule out a tumor of the spinal cord. Dr. Jepson's treatment by Buck's extension, stiff bed, corsets, belts and casts is similar to the method carried out at the Mayo Clinic. The facet syndrome has not been generally recognized, and I believe Dr. Ghormley's paper is timely, for the facets are true joints, subject to the same stresses, strains, injuries and diseases to which other joints are subject, and with modern roentgenographic technic the physician has the opportunity to study the changes that take place in them and to appreciate their importance.

DR. ROBERT B. OSGOOD, Boston: Dr. Jepson's division into four distinct types may be useful to the general practitioner, but I think it is perhaps dangerous if it becomes routine among surgeons whose experience makes it possible for them to think for themselves. For example, not every case of traumatic backache is always associated with sciatic scoliosis, and not every case of sciatic scoliosis is due to trauma. I take it that all of Dr. Jepson's cases were treated by the method he advocates. I should like to see a chart added to the paper, a copy of which Dr. Jepson was kind enough to let me have before this meeting, giving an exact diagnosis and a division into his types or a combination of them, and the number of cases completely or partially relieved, and the duration of symptoms before relief. In the six cases reported in his paper, no exact diagnosis is given and the end-results he has reported suggest rather a long period of cure, which in case 1, for instance, is reported as lasting a year; in case 2, two years; in case 3, a year and eleven months; in case 4, eleven months; in case 5, a year and eleven months; in case 6, three years and nine months. Undoubtedly, in Dr. Jepson's cases relief was complete long before that time, but it gives the impression that the treatment is somewhat prolonged. Dr. Ghormley has done a real service in recalling to attention the importance of these changes in the lumbosacral and the sacro-iliac facets, as have Dr. Goldthwait and Drs. Wilson and Danforth. Dr. Putti, especially, in his Lady Jones lecture, has called attention to this extremely common narrowing of the lumen by changes in the facets. There is perhaps no region in the body where anatomic variations are more common, not only in the way of sacro-iliac changes, but when the potentialities of irritation exist because of unequal leverage, and therefore potential strain and traumatic arthritis, with which Dr. Jepson is most concerned. I am of the opinion that very accurate diagnoses will be missed often if the true sciatic pain and associated pain are considered as referred only from lesions of the sacro-iliac joint. Tuberculosis of the sacro-iliac joint and displacement of the sacro-iliac joint are often free from sciatic pain, and it gives proper cause for further consideration of referred pain. Probably lumbosacral lesions are more common than sacro-iliac lesions, in spite of medicolegal evidence to the contrary. The accuracy of diagnosis should be very much improved by the new oblique technic and the presence of the lesion clearly shown if the roentgenologist can learn the technic accurately. It is a rather difficult technic for the ordinary roentgenologist to learn. The presence of these occlusions of lumens is demonstrated very easily in the collection of spines to which Dr. Ghormley has referred, and in the arthritic exhibit here the spines of the hypertrophic arthritis cases show an almost complete occlusion of the facets. We must as a rule, then, learn the exact anatomic structure and the lesions of the lumbosacral facets if we are to make an accurate diagnosis and apply the proper treatment.

DR. LEWIS CLARK WAGNER, New York: The defective articular facet is most of all to be associated with defects in the pedicle and laminae of the vertebrae. I see many cases of this

sort at the Neurological Institute in New York and the Hospital for Ruptured and Crippled. This type of case sooner or later presents neurologic symptoms and signs. In an analysis of a number of cases of congenital defects of the lumbosacral joint, all of which have been studied and proved, the occurrence of pain was as follows: pain in the sacro-iliac region, 10 cases; pain in the vicinity of the lumbar muscle of the affected side, 12 cases; bilateral, 1 case; pain over the sacrolumbar joint, 10 cases; pain on the opposite side, 1; pain in the gluteal muscle and hip, 4; pain over the sciatic notch, none; pain on the outer side of the thigh and knee, 5; pain along the sciatic nerve, 3; numbness about the outer side of the leg and calf, 4; pain about the instep, 5. This next is very important: could produce pain by certain movement, 5; lying down relieved pain, 6; trauma the cause because of sudden fall, 7 cases. As to the duration of symptoms: 1 case, eighteen years; 2 cases, ten years; 1 case, five years; 5 cases, four years; 1 case, three years; 2 cases, two years. Next is the age at which symptoms appeared: 1 case, 18 years; 1 at 24 years; 1 at 25 years; 2 at 30 years; 1 at 32 years; 1 at 33 years; 1 at 34 years; 2 at 35 years; 1 at 36, and 1 at 37 years. A man, aged 36, of stocky build, came under my care in 1925 with the history of eighteen years of recurrent attacks of pain, deformity and disability in his spine and left leg. These attacks were brought on by the slightest unguarded muscular activity, such as leaning over to tie his shoe or to lift small objects. He had so much numbness, coldness and atrophy of the left leg that I felt sure he was suffering from a nervous condition. I did not appreciate the anomaly or absence of articular facets in this case until 1930, at which time a lumbosacral fusion was done with complete relief of pain. However, the numbness was the last symptom to disappear. In lumbosacral anomalies the subjective pain is segmental in distribution, being completely localized to the areas supplied by the first, second and third segments. In the cases under consideration, the inflammation about the spinal column and its articulations causes spasm of the lumbar muscles with a physicochemical irritation of them and a great deal of the pull on their periosteal attachments with a further demonstrable tenderness. The rotation of the fifth lumbar vertebra associated with a too adherent dura to the spinal nerves as they make their exit from the vertebral foramina, or the narrowing of the intervertebral foramina, must transmit such irritability to the spinal cord over the nerves supplying the muscles, ligaments and periosteum affected.

DR. PAUL N. JEPSON, Philadelphia: I think that the suggestion to include the anomalies of the back in my classification, is an excellent one, but for the sake of brevity I limited my paper to traumatic lesions only. Perhaps I was unfortunate in the selection of the cases illustrating traumatic backache, but these six cases appeared to be rather typical. The duration of the period of disability prior to the treatment varied from four weeks to six months. In those cases requiring operation the disability lasted for more than a year. I want to express my appreciation of the splendid discussion.

DR. RALPH K. GHORMLEY, Rochester, Minn.: I am glad that Dr. Meyerding and Dr. Wagner mentioned the importance of a neurologic examination. There certainly is nothing more important when one is considering surgery in these cases than a neurologic examination. My own feeling is, as Dr. Wagner has mentioned, that a lumbar puncture should be done. The technic of the three-quarters view or the oblique view will be published shortly. It has been worked out by the roentgenologic department. It is not always easy to get good roentgenograms of this type, and much care must be exercised in taking these pictures. Dr. Putti has ably discussed these pathologic changes and advocated extensive excision of these facets. It is a little unwise to remove many facets because the stability of the spine may be so affected that damage may be done. I didn't mention the postoperative care in this type of operation. We put the patients to bed after the operation on a Bradford frame, using a scultetus binder. At the end of six weeks the patients are allowed to be up with a canvas belt or corset. Four months later we take check-up roentgenograms to make sure that fusion has taken place. We give them exercises to rehabilitate the muscles which are so severely atrophied at that stage.

CARBON DIOXIDE AND OXYGEN IN OBSTETRICS

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The presentation of this paper is in the nature of a preliminary report of our observations over the last two years in our private work, and during the past year in the Louisville City Hospital. The subject matter herewith deals principally with the clinical results, together with a brief discussion of physiology, in our use of carbon dioxide and oxygen mixtures as a therapeutic agent in the treatment of some complications of obstetrics. We plan, at a later date, to report the results of experimental laboratory studies on this subject. Among the complications thus treated are asphyxia and atelectasis neonatorum, postlabor and postanesthesia shock, uterine inertia during labor, postpartum hemorrhage, the terminal depression of severe toxemia, and postcesarean abdominal distention.

Current literature teems with the controversy between a group of investigators who contend that carbon dioxide is superfluous and harmful to the asphyxiated newborn infant[1] and another group[2] who claim that oxygen alone is not entirely adequate for resuscitation of asphyxia neonatorum. It is our conclusion after clinical investigation and diligent perusal of the literature that both groups are right as far as they go but that the common ground between them, the use of adequate and intelligently varied mixtures of carbon dioxide and oxygen, will give the desired result in resuscitation when nerve cells of the center have not been deprived of the minimum supply of oxygen and carbon dioxide for the maintenance of fetal existability.

Three years of oxygen administration (1928-1931) with some means of artificial respiration failed to decrease the mortality rate in the asphyxias or to overcome atelectasis, the forerunner of pneumonia. Carbon dioxide alone was obviously not used; but the use of variable mixtures of carbon dioxide and oxygen, from 5 to 30 per cent of carbon dioxide, with a full complement of oxygen, for the past two years in our practice of obstetrics and treatment of the new-born enables us to say that we have not failed to resuscitate a single asphyxia patient except one with cerebral hemorrhage and one with a congenital abnormality of the heart. Both infants were premature. We have had no atelectasis that was not easily controlled with the mixtures and have had no subsequent bronchitis or pneumonia. Similar treatment of the new-born in the obstetric service at the Louisville City Hospital, for the past year, has yielded equally good results in respect to neonatal pulmonary complications.

An understanding of the physiology of respiration and the pathology of asphyxia is a prerequisite to the intelligent administration of the gases, and the results are in direct proportion to the degree of such understanding. The ready-made mixtures of 5, 7 or 10 per

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1. Eastman, N. J.: Fetal Blood Studies, Bull. Johns Hopkins Hosp. **50**: 39-50 (Jan.) 1932. Kane, H. F., and Kreiselman, Joseph: Carbon Dioxide Content of the Blood in the New-Born, Am. J. Obst. & Gynec. **20**: 826-827 (Dec.) 1930.

2. Henderson, Yandell: Resuscitation from Asphyxia in New-Born and Others: Its Control and Treatment, New England J. Med. **199**: 977-979 (Nov. 13) 1928. Sword, B. C.: Remarks on Causes of Asphyxia of the New-Born and on Resuscitation, ibid. **199**: 979-980 (Nov. 13) 1928.

cent of carbon dioxide with their complement of oxygen are safest for the average physician, but they cannot be applied with success in all cases, for we have found that, as a rule, the greater the degree of asphyxia and lowered excitability of the centers, the higher the percentage of carbon dioxide necessary for stimulation. The classic differentiation of asphyxia livida and pallida are examples, the pallida being simply a greater degree of asphyxiation and requiring higher percentages of carbon dioxide for stimulation. The laryngeal reflex used as a means of distinguishing the degree of asphyxia has never been used by us, as we feel that it is a waste of time. It is easy to insert a tracheal catheter if response to the mixtures of 20 or 25 per cent carbon dioxide is not shown within a few seconds. When mixtures above 5 per cent are used they must gradually be lowered as response increases, so that the respiratory efforts of the child will be stimulated only slightly above normal action. The mixtures should never be given strong enough to cause a gasping, struggling, straining type of respiration. The objective symptoms are the guide, and the nearer the normal respiratory rate the treatment can be carried out, the longer it can be kept up and the more oxygen can be furnished to the tissues.

It has always been our idea to use carbon dioxide as a vehicle for oxygen supply to the tissues. Coryllos [3] has shown that oxygen passes more quickly from the air sacs to the blood when a small percentage of carbon dioxide is present.

Our routine neonatal treatment of premature infants includes the administration of 5 per cent of carbon dioxide and 95 per cent of oxygen into a tent for a few minutes three times a day. The length of time of each treatment is determined by the respiratory response of the patient, but the average is about fifteen minutes.

The development of shock during anesthesia and following the emptying of the uterus is mainly due either to the anesthetic or to fatigue, or to both. The cause in both instances is ultimately the same, for to the acidosis and paralyzing effect of the anesthetic is added the increased lactic acid production of the maternal tissues with displacement of carbon dioxide from the base.

If the degree of acidosis is sufficient to produce a mild degree of shock with splanchnic endorsement, an insufficient amount of oxygen and carbon dioxide is supplied to the uterine muscle to oxidize its excessive load of lactic acid.[4] A local acid base imbalance remains and increases in the smooth muscle cells with subsequent shock and loss of tone of the uterine muscle, and postpartum hemorrhage then occurs.

All of the mechanical methods [5] of control of postpartum hemorrhage cause an ischemia of the uterine muscle, thereby defeating any possibility of immediate restoration of function. Therefore the treatment of postpartum hemorrhage resolves itself into the treatment of shock. The administration of carbon dioxide and oxygen, by decreasing the primary acidosis,[6] elevates the general nervous tone [7] and accelerates circulation,[8] thereby reestablishing normal tone and function of the uterine muscle.

In shock due to anesthesia, the administration of carbon dioxide and oxygen stimulates the respiratory center, causing an increase in respiratory depth and rate, thereby furnishing more oxygen to the hemoglobin, relieving acidosis, stimulating the heart muscle, accelerating circulation and elevating tissue tone.

Something more than one year ago our attention was called, in a rather unique manner, to a possible effect of carbon dioxide inhalations as a stimulant to uterine contractions during labor. A private patient who had been having a prolonged first stage with weak, irregular contractions was developing uterine inertia. We thought it likely that she was having a fatigue acidosis and decided to administer several inhalations of carbon dioxide and oxygen to see what clinical effect we would get in combating the fatigue. After a few inhalations we noticed that the uterus began a good contraction, followed by adequate relaxation. After this contraction, we gave the patient a few more inhalations and were gratified to see the contractions occurring with good regularity and force. Our impression was that the carbon dioxide had stimulated normal uterine contractions with normal relaxation periods. Recognizing the possibility of these phenomena being coincidental, we employed the same procedure in every case of inertia and found a uniformity of response that removed any reasonable doubt as to its effect as a stimulant. Further observations carried on in the City Hospital substantiated our results.

Among the inertia patients at the City Hospital were a number who had received caudal anesthesia, and in these the response was much slower. Our best results were obtained in inertia caused by fatigue or that developing in connection with the administration of such drugs as morphine, sodium amytal, nembutal and chloroform.

As soon as it seemed fairly well established that carbon dioxide actually did have a stimulating effect on uteri suffering from inertia during labor, we decided to employ it in those cases of excessive bleeding due to inertia following the expulsion of the placenta. Ordinarily there will be only normal bleeding if contractions during the third stage have been strong enough to expel the placenta spontaneously. But there is a certain percentage of cases in which some degree of shock occurs after a physiologic third stage, owing to relaxation of the patient following prolonged, tiring labor, or associated with some form of anesthesia. The degree of shock in most of these cases is so slight that the relaxation of the uterus is the only clinical evidence of depression; or it may rarely become sufficiently severe to have the clinical picture of surgical shock. We feel that, from our observations, this mild form of shock is the cause of more postpartum hemorrhage than has hitherto been thought.

In our private work we have adopted the plan of administering a few inhalations of carbon dioxide and oxygen immediately following the expulsion of the placenta and have had no undue bleeding from the placental site in any of these cases in two years. In the City Hospital we have, for the past several months, employed carbon dioxide and oxygen inhalations as a routine in all cases of profuse bleeding from the placental site following the expulsion of the placenta. Records on twenty-five such cases show uniformly

3. Coryllos, P. N., and Birnbaum, G. L.: Alveolar Gas Exchanges and Atelectasis: Mechanism of Gas Absorption in Bronchial Obstruction, Arch. Surg. **21**: 1214-1281 (Dec.) 1930.

4. Eastman, N. J., and McLane, C. M.: Foetal Blood Studies, Bull. Johns Hopkins Hosp. **48**: 261-268 (Feb.) 1931.

5. De Lee, J. B.: Principles and Practice of Obstetrics, ed. 6, Philadelphia, W. B. Saunders Company, 1933, pp. 840-853.

6. Hendon, G. A.: Venolysis, J. A. M. A. **95**: 1175-1177 (Oct. 18) 1930.

7. Sollmann and Pilcher: Vasomotor Center, J. Pharmacol. **1**: 571, 1910.

8. Henderson, Yandell, and Harvey, S. C.: Veno-Pressor Mechanism, Am. J. Physiol. **46**: 533 (Aug.) 1918.

good results. We are reporting briefly four of these cases taken at random from this list as typical of the results we have obtained. In these cases carbon dioxide was not used as a prophylactic, as in our private work; therefore we were better able to study its effect as a therapeutic agent to check a hemorrhage already established.

REPORT OF CASES

CASE 1.—R. M., a white girl, aged 17 years, a primipara and primigravida, had a funnel pelvis. The first stage of labor, Nov. 7, 1932, lasted thirty-six hours; the second stage, five hours and forty minutes. She was delivered of a female infant, weighing 7 pounds and 4 ounces (3,300 Gm.), with difficulty by low forceps, under chloroform anesthesia. The blood loss was 600 cc. The patient became cyanotic, and carbon dioxide, 5 per cent, and oxygen, 95 per cent, was given by inhalation. After ten minutes cyanosis disappeared and the patient's condition became satisfactory. Fifteen minutes later she showed evidence of shock, as bleeding became profuse. The carbon dioxide and oxygen was given for five minutes, while symptoms of shock disappeared, the uterus began to contract and hemorrhage ceased. After this, no evidence of shock or hemorrhage appeared.

CASE 2.—M. G., a Negress, aged 23, a secundipara and secundigravida, was admitted Dec. 25, 1932, with fever of 102 F. The os was completely dilated. She had been in labor eight and one-half hours. Caudal anesthesia was given and she delivered a female infant weighing 7 pounds and 2 ounces (3,230 Gm.). The placenta separated spontaneously after twenty-five minutes. The uterus failed to contract, despite the administration of solution of pituitary and ergot, and bled profusely. The cervix was examined and showed no tears. The fundus would not remain hard despite repeated doses of solution of pituitary. The patient went into shock and was given inhalations of carbon dioxide, 5 per cent, and oxygen, 95 per cent. She rallied well, the uterus contracted and hemorrhage stopped. Her condition remained good.

CASE 3.—B. B., a woman, aged 39, a quintodecipara and quintodecigravida, Nov. 1, 1932, was in a toxic condition, with a blood pressure of 150 systolic, 95 diastolic. At 5 p. m. she noticed a slight pain and the membranes ruptured, at which time 12 inches of cord prolapsed. The patient was put on the delivery table in the Trendelenburg position, and under gas anesthesia unsuccessful attempts were made to restore the cord. The cervix was found to be dilated from 2 to 3 cm. Dilatation occurred rapidly and a still-born male infant weighing 7 pounds and 12½ ounces (3,530 Gm.) was delivered by podalic version and breech extraction. Acute pulmonary edema developed during anesthesia and the patient bled profusely from the relaxed uterus, losing 800 cc. of blood. The hemorrhage ceased under inhalations of carbon dioxide, 5 per cent, and oxygen, 95 per cent. The blood pressure had dropped to 94 systolic, 58 diastolic. Carbon dioxide was given every fifteen minutes for four hours, at which time pulmonary edema had disappeared. The blood pressure and general condition remained satisfactory.

CASE 4.—M. B., a white girl, aged 16, a primipara and primigravida, June 9, 1933, had been in the first stage of labor forty hours and in the second stage fifteen minutes. She was delivered by midforceps. The pelvis was of the rachitic type. The placenta was delivered fifteen minutes later by the Credé method because of uterine bleeding with uterine inertia before the placenta was expelled. Solution of pituitary, 0.5 cc. and one ampule of ergot were given immediately after the placenta was expelled; profuse hemorrhage then occurred. Solution of pituitary was repeated in five minutes. This treatment, combined with massage and pressure, failed to stimulate uterine contractions. Carbon dioxide, 5 per cent, and oxygen, 95 per cent, was given for five minutes, twenty minutes after the placenta was expelled. Within one minute the uterus developed a firm contraction, the first since the placenta was delivered, and contractions continued, controlling the hemorrhage. About ten minutes after carbon dioxide was discontinued, uterine relaxation with bleeding was again noticed. Carbon dioxide was again administered and the uterus again contracted satisfactorily without further hemorrhage. The blood loss was 1,000 cc.

It will be noted that in cases 1 and 2 some shock was a demonstrable complication of the bleeding, and in case 3 a toxic condition with acute pulmonary edema accompanied the hemorrhage.

In a certain percentage of cases of eclampsia the toxemia becomes so severe that a paralyzing effect on the cardiovascular system takes place, with the result that the elevated blood pressure drops rapidly to far below normal limits, the pulse becomes very rapid and thready, and pulmonary edema quickly develops. The patient becomes cold and sweaty, the respirations become slow and shallow, and she dies of the depressive influence of the toxin. We have employed carbon dioxide in five cases of this type with prompt recovery in three. In the two cases in which death resulted, autopsy showed a severe coexistent infection, in one case a well established pneumonia and, in the other, liver abscesses. Both patients had developed postpartum eclampsia in the home and were brought into the City Hospital after a long delay. Case 5 illustrates the success of carbon dioxide therapy in a severe depressive condition such as described, even when the case is complicated with a probable pneumonia, treatment being instituted early:

CASE 5.—Mrs. P. W., a white woman, was delivered by her family physician of a living child at 8:20 a. m., Aug. 30, 1932. The prenatal history was normal. Soon after delivery a headache developed which increased in severity. Two hours and forty minutes after delivery she began having convulsions and became unconscious. She was admitted to the Deaconess Hospital and seen by one of us (W. T. M.) at 2 p. m. The blood pressure was 148 systolic, the diastolic pressure not registering. The temperature was 103.6 axillary; the pulse was irregular and 136 per minute; respirations were 28. Severe pulmonary edema and cyanosis were present. A catheterized specimen of urine showed albumin 3 plus. The diagnosis was postpartum eclampsia. She was given 7½ grains (0.5 Gm.) of sodium amytal, 100 cc. of 50 per cent dextrose and 1 cc. of digifoline, intravenously, followed by gastric lavage, 4 ounces of magnesium sulphate saturated solution being left in the stomach. At 3:30 p. m. her condition was worse and oxygen was administered by tent, with no improvement even in cyanosis. At 6:15, carbon dioxide, 10 per cent, and oxygen, 90 per cent, was administered for twenty-five minutes by tent. The respiratory volume increased. The rate increased from thirty-six to forty-four per minute. The cyanosis disappeared. At 8:30 the blood pressure was 95 systolic, 35 diastolic; the pulse, 128, full and regular. The temperature was 102.2 F. The respiratory rate was 32. The patient answered questions and drank water. Examination of the chest showed only a few scattered fine râles. At 9:15, carbon dioxide, 5 per cent, and oxygen, 95 per cent, was again given, being administered fifteen minutes each hour. The patient talked intelligently at will, saying she felt better. August 31, at 7:30 a. m., eleven hours after carbon dioxide and oxygen was started, the temperature was 99 F.; respiration rate, 28; pulse, 100; blood pressure, 122 systolic and 80 diastolic. The chest was clear. There was a trace of albumin and the urinary output increased. Carbon dioxide, 5 per cent, and oxygen, 95 per cent, was administered three times a day for two more days. The patient made an uneventful recovery.

We report briefly one case of acute yellow atrophy of the liver, occurring post partum:

CASE 6.—Mrs. L. W., a white woman, aged 30, a primipara and primigravida, seen in consultation by one of us (W. T. M.), was delivered after forty-eight hours of first stage labor, of a 3½ pound (1,587 Gm.) seven months fetus. Owing to a marked congenital cervical atresia, a vaginal cesarean section was necessary to extract the fetus. On the second day following, a classic case of acute yellow atrophy developed, with almost immediate coma. A continuous flow of 10 per cent dextrose with calcium gluconate was given through a cannula anchored in the vein by venoclysis (Hendon[6]). At varying intervals the patient's respi-

rations would become very shallow and soon would cease altogether, the pulse becoming very rapid and weak. Artificial respiration forcing carbon dioxide into the lungs was used. After several such forced inhalations, breathing would again become spontaneous and within a few minutes would be fairly normal, the heart tone and the patient's color improving. For the first two or three forced inspirations, a concentration of 50 per cent carbon dioxide was used. As soon as respiration became spontaneous, the oxygen percentage was increased to 95 and continued thus for two or three minutes. These attacks became less frequent until after three days of continuous dextrose and intermittent carbon dioxide administration the coma disappeared, the jaundice began to clear up, and the patient made a satisfactory recovery.

Abdominal distention following cesarean section is due to shock, paralysis of the splanchnic nervous system, loss of smooth muscle tone and decrease in local circulation. Pressure in the intestine aggravates the condition. An increase in carbon dioxide tension has long been known to stimulate smooth muscle activity.[9] Therefore one would expect the administration of carbon dioxide and oxygen to stimulate peristalsis and restore normal cellular function. We have found in our work in the City Hospital that this hypothesis is borne out by clinical results. Our records show that the gas mixture was used in sixteen consecutive cases with success.

Case 7 is reported herewith as a typical result:

CASE 7.—F. D., a Negress, aged 16 years, a primipara and primigravida, with a generally contracted pelvis, after a six hours trial labor was delivered of a 6 pound and 11 ounce (2,933 Gm.) baby by Phaneuf low cesarean section. About eight hours after operation the patient became distended with gas. After thirty-six hours with no relief, carbon dioxide, 5 per cent, and oxygen, 95 per cent, was administered for five minutes. This was repeated every half hour for four doses. Immediately after the first administration the patient asked for a bed pan and passed a large amount of flatus and a watery stool. From this time on, intestinal peristalsis continued. Before the carbon dioxide administration, enemas, colon tube and gastric lavage had been done without any stimulation of peristalsis.

CONCLUSIONS

1. From 1928 to 1931, oxygen therapy was applied to all the conditions described, without any appreciable change in morbidity or mortality.

2. Carbon dioxide and oxygen mixtures, when administered by the metric control system, have been adequate for the relief of asphyxia neonatorum, atelectasis neonatorum and its sequelae over a period of two years.

3. Carbon dioxide and oxygen mixtures safely and promptly combated uterine inertia in the first stage of labor.

4. The classic mechanical treatment of postpartum hemorrhage does not stand up under physiologic investigation. Hemorrhage is evidently due to postpartum acidosis of the uterine muscle. Carbon dioxide and oxygen controlled twenty-five consecutive cases.

5. The abdominal distention following cesarean section was promptly relieved in sixteen consecutive cases, even after thirty-six hours' duration in one instance.

6. The practical points in symptomatic administration are that treatment will usually be started with mixtures of between 20 and 30 per cent of carbon dioxide with oxygen. This high percentage is only for stimulation of the respiratory center and must be promptly reduced, after a few inspirations, to the percentage that will maintain a normal or slightly higher respiratory rate. Strict regard must be paid to the fact that even 5 per cent of carbon dioxide and 95 per cent of oxygen will overstimulate in some cases and should then be used for only a few minutes at a time.

321 West Broadway.

9. Hooker, D. R.: Carbonic Acid, Am. J. Physiol. 31:47, 1912.

ABSTRACT OF DISCUSSION

DR. WALTER M. BOOTHBY, Rochester, Minn.: The question of oxygen therapy is not limited to obstetrics. However, in obstetrics there is undoubtedly an ample opportunity for its extensive use. For example, as it is impossible to choose the time of delivery, the patient at delivery may have a slight cold such as would lead to the postponement of an ordinary surgical operation; or, worse, she may have severe bronchitis or even pneumonia. Under these conditions the proper use of an oxygen tent before and during the early stages of delivery would be most helpful. In addition to the beneficial effects of oxygen, one can obtain by the use of the modern type of tent the added comfort, in warm weather, of an atmosphere cooled 10 or 15 degrees below the room temperature. The disadvantage of oxygen therapy is its expense, but with modern tents and proper management the cost is not prohibitive. Oxygen cannot be properly administered unless frequent analyses are made of the oxygen and carbon dioxide content of the tent air. Oxygen therapy is also of great benefit to either premature or term infants who have any respiratory difficulty. For this purpose a Hess incubator can be easily modified so that it will become a miniature oxygen chamber. The question of the administration of carbon dioxide in addition to oxygen is, of course, an important one. However, I think the title of the paper, "Carbon Dioxide and Oxygen in Obstetrics," emphasizes the wrong point. Oxygen therapy is undoubtedly beneficent; the presence in the inspired air of between 1 and 2 per cent of carbon dioxide will do no harm and may possibly do some good by increasing the depth of respiration. The inhalation of mixtures containing 30 per cent of carbon dioxide, as occasionally recommended by some, is dangerous and of course cannot be done for more than very few breaths.

DR. E. D. PLASS, Iowa City: I should like to ask the authors what evidence they have that the administration of oxygen and carbon dioxide relieves acidosis and that the stimulation of the uterus in first stage inertia is attributable to a change in acid-base balance. It has been my experience in another connection that the production of acidosis by starvation acts as a very efficient uterine stimulant, inducing labor in from 30 to 50 per cent of patients.

DR. HENRY F. BECKMAN, Indianapolis: May I ask a question? If the carbon dioxide mixture stimulates and establishes respiration after birth, what does it do to the infant before birth when given to the mother?

DR. W. T. McCONNELL, Louisville, Ky.: I thank Dr. Boothby for emphasizing certain precautions in regard to the use of carbon dioxide. One of them is that even a weak mixture (5 per cent) can be breathed too long and result in a modified convulsion. Therefore, one must stop it when the physiologic effect has been obtained. The reason we say 5, 10 or 20 per cent when we use the stock mixtures is that that is what is on the carton and is not always what the patient gets when mixed with the air in a tent. When we make our own mixtures with the machine we use we know what they are getting when given by direct inhalation. The extent of depression of the centers governs the concentration needed to revive the patient, whether it is asphyxia, shock, inertia or hemorrhage. It takes an experienced man to understand the responses in such a way as to administer it intelligently. With regard to the muscle tone of the uterus, all I can say personally is that whatever causes the shock, producing the relaxation of the uterus, can be relieved by carbon dioxide. Dr. Boothby says it is not carbon dioxide that accomplishes results, but the oxygen. We agree with him. The carbon dioxide is the vehicle by which the oxygen is made available to the tissues. In answering the question with regard to acidosis, I wish to state that there is a marked increase in lactic acid at the end of the second stage. Our experience convinces us that this causes the shock; but, whatever it is, our clinical results show that weak mixtures of carbon dioxide and oxygen stimulate muscle

tone and accomplish the results. As to what effect it has on the baby before it is born, our observation is that the babies are born in a better condition, need less resuscitation and are of a better color when the mother has been given a little carbon dioxide and oxygen just before the baby is completely born or just after the head is out. We have watched this in a large number of cases and it works out that way. The apparatus we use in our private work is the McCormack resuscitator carbon dioxide machine and it can be seen in the Scientific Exhibit.

PHARMACOLOGIC ACTION OF BARBITURATES

THEIR USE IN NEUROPSYCHIATRIC CONDITIONS

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The barbituric acid derivatives have recently assumed a rather prominent rôle in the treatment of psychotic patients. Although among psychiatrists interest has primarily centered around the psychologic reaction produced by these drugs, I believe that a concise consideration of the pharmacologic action would not be amiss.

Though in general their action is quite similar, they differ principally in rate of effectiveness, rate of elimination and, to some extent, degree of toxicity. The more commonly used barbiturates can be divided into two groups: the shorter acting drugs, consisting of pentobarbital sodium, amytal and secondary butyl beta bromallylbarbituric acid sodium salt, and the longer acting group, consisting of phenobarbital, neonal, ipral, a barbital derivative with amidopyrine, dial and barbital. In general, all are somewhat more rapid in their action if combined with sodium. The degree of toxicity has been worked out by Barlow,[1] who gave the order of toxicity, from high to low: secondary butyl beta bromallylbarbituric acid sodium salt, barbital, phenobarbital, amytal, neonal, a barbital derivative with amidopyrine, dial and pentobarbital sodium.

PHARMACOLOGIC ACTION

Effect on Metabolism.—The basal metabolic rate is little affected by barbituric acid narcosis. There is rather a slight initial fall, which then remains constant.[2] Guinea-pigs which were under the influence of barbiturates and were given thyroid extract showed a rise in basal metabolic rate similar to the controls which had not received the drug.[2a] A slight fall in body temperature usually occurs.

Some controversy exists in regard to their influence on sugar metabolism. Page [3] and Deuel [3b] found no change in the blood sugar. Isenberger [4] found no appreciable change in the blood sugar, but stated that in some cases a decrease in sugar tolerance could be demonstrated. Underhill [5] reported an increase in blood sugar in rabbits. Hines [6] reported that amytal lessened the ability of the animal to handle dextrose, and he found an increase in blood sugar with glycosuria. In a later communication,[7] he reported the muscle glycogen to be about the same in animals with and without amytal anesthesia. When dextrose was given intravenously, he found the liver glycogen to be more than twice as high in animals anesthetized with sodium amytal as in unanesthetized animals. Most investigators agree that the increase in blood sugar rarely exceeds normal limits.[8]

Effect on Circulation.—A fall in blood pressure has been a constant finding. The most striking fall is brought about by sodium amytal and, when given intravenously, is somewhat proportionate to the rate of injection. The fall in systolic blood pressure is proportionately greater than that in diastolic pressure.[9] A slight rise in diastolic pressure has been reported.[10] In cases of hypertension, a fall in systolic pressure from 200 to 100 mm. of mercury has been noted.[11] The fall in blood pressure is less pronounced when longer acting drugs are given. It usually returns to its former level in from thirty minutes to two hours.

The pulse rate is usually slightly increased. On some occasions a decrease in pulse rate has been noted,[12] but this usually occurs when the pulse is accelerated because of excitement.[9]

Vasodilatation of the peripheral circulation is produced, resulting in flushing [13] and, in some cases, in cyanosis.[13] There is also a resultant decrease in the tonus of the heart muscle.[14] The permeability of the endothelium of the capillaries is altered,[15] and water is directed toward the tissues of the body.

Gruber and Roberts have made detailed studies of the effect of both longer and shorter acting drugs on the cerebral circulation [16] and the coronary circulation.[17] In each case they found that vasodilatation took place when the drug was injected in dilute solution. They concluded that the barbituric acid derivatives acted directly on the wall of the vessel, causing vasodilatation.

Blood Chemistry.—A definite fall in the calcium content of the blood occurs.[18] A similar fall in blood calcium has also been demonstrated during sleep induced by other hynotic agents.[18a] The changes in potassium content have not been constant; there may be either an increase [18a] or a decrease.[18b] The phosphorus and magnesium content is decreased,[18b] while a slight increase in blood bicarbonate has been found.[19] Depression of respiration causes an increase in carbon dioxide tension.[20] The carbon dioxide-combining power is not affected [21] if respiration is not depressed, as has been shown by the intratracheal administration of oxygen.[19] The hydrogen ion concentration is slightly increased if

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19. Bourne, W.; Bruger, M., and Dreyer, N. B.: Anesth. & Analg. **10**: 85 (March-April) 1931.
20. Katzenellbogen.[18b] Bourne, Bruger and Dreyer.[19]
21. Hines, Leese and Barer.[7] Bourne, Bruger and Dreyer.[19]

the drug is given intravenously,[22] the p_H value falling from 0.1 to 0.2 unit.[19] Dilution of the blood has been shown to occur and has been explained as being due to an accumulation of corpuscles in the spleen, which is increased in size.

Effect on Respiration.—All members of the barbituric acid series depress the respiratory system when doses large enough to produce deep narcosis are administered.[23] The rate of respiration may be decreased,[24] but more commonly it is increased.[25] The respiratory excursion usually becomes shallow.[26] The shorter acting barbiturates produce death by respiratory paralysis,[27] in which case the thorax is usually expanded, and pressure on it will permit it to fill. The patient may again resume breathing, since the margin of safety between respiratory failure and cardiac failure is fairly wide.[9] In prolonged narcosis, especially if the longer acting drugs are employed, pulmonary edema usually occurs, the patient is unable to raise mucus,[28] and death may occur from pulmonary congestion or other complications such as pneumonia.[27]

Effect on Renal Function.—When the drug is given in hypnotic doses, the urinary output is usually appreciably diminished,[28] but the flow of urine returns to normal within from six to twenty-four hours.[29] There is no impairment of glomerular activity, as shown by the phenolsulphonphthalein excretion,[30] even when the drug is given in fairly large doses over a comparatively long time.[13b] The urea output is diminished for a period of from four to six hours,[19] while the excretion of urate and phosphoric acid [19] is slightly increased for twenty-four hours following administration of the drug. Acetone has been found in small amounts for twenty-four or forty-eight hours.[13b]

Effect on Hepatic Function.—Some controversy exists in regard to the effect on the liver. Some investigators have found a slight but transient damage to the liver with no delayed injury, and have considered the effect negligible.[19] Others have been able to demonstrate very little action on hepatic function, as shown by the bromsulphalein test,[9] while, as stated previously, Hines [7] found the glycogen in the liver to be more than twice as high in animals anesthetized with sodium amytal as in unanesthetized animals when dextrose was given intravenously.

Effect on the Gastro-Intestinal Tract.—Few experimental data are available concerning the effect of the barbiturates on the gastro-intestinal tract. A number of clinical observations have been made, and it has been observed in surgical work that nausea and vomiting are considerably decreased when barbiturates are used as premedication for ether anesthesia.[23a] It has also been noted that they control vomiting in gastric crises of tabes.[28] They have been shown to decrease the tonus and amplitude of contraction of the small intestine of rabbits.[14]

Neurologic Changes.—When light narcosis is induced, a slight and transient nystagmus [31] occurs with some vertigo, a feeling of inebriation and staggering gait.[13a] The patient may also complain of double vision.[12] Under light narcosis the pupils are dilated,[32] but as the depth of narcosis increases they contract slightly and may become fixed.[33] The corneal reflexes are diminished [33a] or abolished completely.[34] In light narcosis the speech becomes thick and slurred,[33a] the gag reflex remains intact except in extremely deep narcosis, when it is abolished, and there is a tendency for the tongue to fall back.[13a]

When the shorter acting barbiturates are given in small doses, the deep reflexes are increased.[35a] Both the deep and the superficial reflexes are diminished under larger doses, or they may be entirely abolished.[35] The skin and sphincter reflexes disappear under deep narcosis.[7] With the longer acting barbiturates, the reflexes may be augmented in all stages of narcosis.[14] There may be slight relaxation of the rectal sphincter,[13b] and the tone of the bladder may be lost,[9] making catheterization necessary. Motor restlessness may be present during narcosis, induced by either the longer acting or the shorter acting barbiturates.[13a] Both will control convulsions.[36] However, if the longer acting drugs are given in large doses, they may themselves produce clonic and tonic convulsions.[14] The shorter acting drugs have not been observed to produce convulsions, even in extremely large doses.

The threshold for painful stimuli is decidedly increased,[12] and during deep narcosis no response to painful stimuli can be obtained.[13a] Pain has been controlled in patients with tabetic crises.[28] Seven and one-half grains (0.5 Gm.) of sodium amytal, given intravenously, has controlled pain in a patient suffering from bilateral thrombosis of the iliac arteries when large doses of morphine had failed.[29]

The Psychologic Effect.—The use of barbiturates as premedication in surgical treatment has given valuable information regarding the psychologic effect on normal persons. If barbiturates are given to patients before they are taken to the operating room, the fear and apprehension that are usually encountered are decidedly decreased.[37]

Additional information has been given by Lindemann,[12] who studied a group of students and observed the psychologic effect induced by the administration of small doses of sodium amytal. His observations uniformly showed a striking change in the emotional attitude of his subjects. All of the subjects stated that they experienced a feeling of well-being and serenity, a feeling of warmth and friendship toward the world in general, and gratitude and appreciation for the kindness and goodness of the persons in their environment. They felt a desire to communicate and a willingness to speak about personal problems usually not spoken of to strangers. The future looked bright, and they anticipated future pleasant activities and experiences without effort or drive to carry out their plans immediately. There was no distortion of objects other than a slight

22. Gruber and Roberts.[13a] Cloetta and Thomann.[35a]
23. (*a*) Brown, G.: M. J. Australia **2**:437 (Oct. 8) 1932. (*b*) Zerfas, L. G.: Brit. M. J. **2**:897 (Nov. 29) 1930.
24. Bohn.[9] Murray and Burns.[35]
25. (*a*) Bleckwenn, W. J.: Production of Sleep and Rest in Psychotic Cases, Arch. Neurol. & Psychiat. **24**:365 (Aug.) 1930. (*b*) Zerfas and McCallum.[23a] (*c*) Ni-itsu.[34]
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27. Maloney, A. H., and Tatum, A. L.: J. Pharmacol. & Exper. Therap. **44**:337 (March) 1932.
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30. Emge, L. A., and Hoffman, P. E.: Anesth. & Analg. **10**:88 (March-April) 1931.
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34. Ni-itsu.[34] Bleckwenn.[25a]
35. Bohn.[9] Bleckwenn.[25a]
36. (*a*) Bleckwenn, W. J.: Narcosis as Therapy in Neuropsychiatric Conditions, J. A. M. A. **95**:1168 (Oct. 18) 1930; (*b*) Wisconsin M. J. **29**:693 (Dec.) 1930. (*c*) Lundy.[38]
37. Blakemore, C.: M. J. Australia **2**:174 (Aug. 6) 1932. Lundy.[13a] Brown.[23a] Lundy.[38]

blurring of vision and occasionally double vision. No hallucinations, dreamlike experiences or apprehensive thoughts were experienced. There was no trace of fear, but only the feeling of relief. The shifting of the emotional state along the depressive elation scale was definitely in the direction of elation. Time was usually underestimated. There was no amnesia for conversation or events during the time the subjects were under the influence of the drug.

In psychotic patients, Lindemann [13] and others [39] have noted a similar change in the emotional reaction. Resistive, seclusive and suspicious patients will communicate more freely and become emotionally warm and friendly under the influence of the drug. They express a feeling of well-being and a desire to retain this feeling.

Mute patients can frequently be made to communicate delusional ideas which could not otherwise be obtained, but the drug has no influence on the structure of the delusional ideas and hallucinations present before administration.

The Toxic Effect.—Toxic symptoms may result from an idiosyncrasy to barbiturates. Most commonly they occur from the long-continued use of moderate doses. This is especially true for the longer acting drugs, which tend to have a cumulative effect. Occasionally toxic symptoms occur because of overdosage, either through accident or due to self-administration with suicidal intent.

The toxic symptoms may be divided into three groups: mental symptoms, reactions of the skin and general symptoms. In acute poisoning with large doses, coma usually occurs. The long-continued use of the drugs produces mental changes such as confusion, uncertainty, defects of attention and memory and impairment of ethical and moral senses.[39] Delusions of persecution with fearful hallucinations and illusions frequently occur.

Two types of reactions of the skin have been described: urticarial wheals with itching, probably due to an idiosyncrasy, and a toxic reaction characterized by a morbilliform or scarlatiniform maculopapular erythema. The onset of this rash may vary from one day to several months after beginning the administration of the drug. It is accompanied by intense itching and lasts from two to ten days after the drug has been discontinued. It usually disappears, with fine branlike desquamation, and occasionally leaves pigmentation in the skin.

The more common general symptoms include an early subnormal temperature with a slight fever after several days. There may be nausea, epigastric pain and diarrhea. Anorexia is almost always present. Speech is usually thick, and the patient may omit words or syllables. Early in acute poisoning, the deep reflexes may be diminished or absent. Later they become hyperactive. The pupils are fixed. Diplopia and nystagmus may be present. Ataxia may be present. In extreme cases of long-continued overdosage or acute poisoning with large doses, coma usually results and may terminate fatally.

The shorter acting drugs produce death suddenly by respiratory paralysis, while the longer acting drugs produce death more insidiously with pulmonary congestion, usually complicated by pneumonia.[27]

38. Murray and Burns.[30] Bleckwenn.[30a]
39. Dougherty, M. S., Jr.: South. M. J. **25**:1145 (Nov.) 1932.

Pathologic Changes.—These changes are quite general for most of the parenchymatous tissue of the body.[40] The changes, although not entirely uniform, do agree in general. The slight variation noted by the different observers has been explained by the variation in the size of the dose taken to produce death and the difference in the time interval between the taking of the drug and the time of death.

There is usually considerable congestion of the capillaries of the brain and meninges with some perivascular hemorrhage and edema. The endothelial cells also show evidence of degeneration. Histologic changes are usually present in the cortex, especially in the deeper layer. The Nissl bodies tend to disappear, and the cortical cells show evidence of degeneration as shown by the disappearance of cell membranes and the presence of granular degeneration products. The cells of all of the important nuclei of the brain stem as well as the cerebellum show similar changes. It seems probable that the cellular damage to the central nervous system is due to the direct action of the drug rather than being secondary to the disturbance of circulation.

Perivascular hemorrhages are usually present in the heart muscle.

The lungs are always congested and may show inflammatory changes.

The effect on the kidney is quite marked. No part of the convoluted tubule is spared, though the distal portion is more affected than the proximal portion. The changes in the glomeruli are less marked, although all show evidence of fatty degeneration.

The liver shows evidence of fatty degeneration. The central portions of the lobes are usually more affected than the periphery.

Capillary congestion with hemorrhage is found in the soft palate, the submucosa of the stomach and the small intestine and mesenteric lymph nodes.

Dosage and Points of Caution.—The dosage of the various barbiturates cannot be definitely standardized. Unfortunately all persons do not respond identically to a given dose.[11] A good rule is to start with the dosage recommended by the manufacturer and then to vary it to get the desired effect.

Rules of caution may be observed with advantage. Obese or debilitated patients tolerate the drug poorly, so smaller dosages should be employed. Patients with arteriosclerosis, hypertension [12a] or myocardial disease [7] or those with an extremely low blood pressure may react poorly to the shorter acting drugs because of their marked effect on the blood pressure.[11] I believe that the shorter acting drugs should never be given to patients with extreme hypertension. I have observed arteriosclerotic and hypertensive patients complain of extreme vertigo and ataxia after taking even small doses of the shorter acting drugs by mouth.

In patients with respiratory obstruction or pulmonary congestion,[11] these drugs should be avoided because of the depressive effect on the respiratory center, as well as the tendency to cause pulmonary congestion.

Antidotes for Barbituric Acid Poisoning.—If acute poisoning with barbiturates is due to taking the drugs in large quantities by mouth, gastric lavage should be employed immediately. If enough of the drug has been absorbed to produce a systemic effect, treatment should be directed primarily toward stimulation of the circu-

40. Jankovich, L., and Fazekas, J.: Monatschr. f. Psychiat. u. Neurol. **84**:15 (Oct.) 1932.
41. Weiss, S.: Am. J. M. Sc. **178**:390 (Sept.) 1929. Zerfas.[29b]

latory and respiratory systems. In this connection, epinephrine, ephedrine and caffeine have been employed effectively. They may be used alone or in two or more combinations.[12a]

Picrotoxin has been shown to antagonize the action of barbiturates quite effectively.[42] It tends to hasten the return of the body temperature to normal and stimulates respiration. It may be used in combination with small doses of ephedrine, which helps to restore the normal blood pressure. Picrotoxin may be given in 0.5 per cent solution in distilled water or in physiologic solution of sodium chloride. Its properties are not affected by heating, and it is quite stable. In rabbits it has been given in doses of from 2 to 5 mg. at intervals of from five to twenty minutes until recovery has taken place. Man is somewhat more susceptible than laboratory animals, but it has been given safely in doses of from 5 to 10 mg. (Murrell, reported by Maloney [29a]). It may be given intramuscularly or intravenously. In poisoning by the shorter acting drugs, it should be administered in fairly large doses and given frequently. With the longer acting drugs it should be given more slowly.[27]

USES IN NEUROPSYCHIATRIC CONDITIONS

The barbiturates can be used with advantage in many neuropsychiatric conditions if the physician always bears in mind the various dangers that may be encountered. The use of the longer acting drugs for the control of epileptic seizures is quite common. The shorter acting drugs have been employed with advantage to control extreme convulsive states when the patient's life is in danger. Sodium amytal has effectively controlled status epilepticus resulting from a tumor of the brain, convulsions of eclampsia, tetanus [36a] and convulsions due to strychnine poisoning.[36b] The drug can be given intravenously, and the convulsions are controlled immediately.

In extreme cases the shorter acting drugs may be used to control pain. For this purpose they are, however, less practical than some other means, since the analgesic action occurs only when extremely large doses are given, which result in deep narcosis.[12a]

The longer acting drugs may be used effectively in the treatment of a psychosis with cerebral arteriosclerosis. When they are given in small doses three or four times a day with potassium iodide, they serve the dual purpose of decreasing agitation and motor restlessness and also aid in the reduction of arterial hypertension. The shorter acting drugs should be used with extreme caution in these conditions, because the fall in blood pressure which usually accompanies their administration results in a feeling of dizziness and may lead to collapse. It should also be borne in mind that the longer acting drugs are eliminated slowly, and the cumulative effect, if administered over a long time, may lead to a delirious reaction.

The problem of securing restful sleep is one that constantly confronts the psychiatrist. There are a number of factors in connection with disturbances in sleep which should be carefully considered. Frequently one finds that a patient is unable to fall asleep on retiring, and his concern and fretfulness about this continue to keep him awake. When sleep finally comes he sleeps soundly the remainder of the night. In such cases a small dose of one of the shorter acting drugs is usually effective, as sleep is induced quickly and the patient continues to sleep even after the drug has been eliminated, and awakens feeling refreshed.

If the patient's sleep is broken by frequent periods of wakefulness during the night, one of the longer acting drugs should be employed. These drugs act more slowly and should be given from one-half to one hour before the patient retires. If the patient retires immediately after taking the drug, he may become fretful because sleep does not come at once and work himself into an emotional state which makes sleep impossible. Since these drugs are eliminated rather slowly, they frequently cause the patient to feel somewhat "dopey" the following morning. This troublesome symptom can be partially eliminated by reducing the dosage to the absolute minimum that will produce the desired effect.

A third type of disturbance in sleep is frequently met in depressed patients, and more especially in those in the later decades of life. These patients frequently awaken in the early morning hours and find it impossible to fall asleep again. Several hours of depressive preoccupation spent in this way will undo the good effect gained from an active therapeutic program of the previous day, and the patient arises more depressed than ever. The shorter acting barbiturates afford an excellent sedative for these patients. If a small dose of sodium amytal or pentobarbital sodium is given when the stomach is empty, with half a glassful of tepid water, sleep is induced almost immediately. The drug is eliminated in a few hours, and the patient awakens to start the day free from the tortures of his depression.

The barbiturates are useful in controlling extreme excitement. In this type of patient, the longer acting drugs are also less effective than the shorter acting drugs. Since they are absorbed rather slowly, the excitement may not be controlled for several hours, and then only if large doses are given. In excited patients, in whom extreme exhaustion may prove fatal, shorter acting drugs may be given intravenously or intramuscularly, and deep narcosis closely resembling normal sleep can be induced in a few minutes.

Recently, deep narcosis of several days' duration has been advocated as a means of therapy in the psychoses,[43] and various members of the barbituric acid series have been employed for this purpose. The method has also been used in connection with induced fever during the narcosis [44] or psychotherapy at the time the patient is emerging from the narcosis. In most instances some gratifying results have been obtained. The marked improvement noted has been variously explained on a psychologic, physiologic and biochemical basis. Undoubtedly the rest, both physical and psychologic, is an important factor. In addition to this, the psychologic phenomena [45] at the time the patient is emerging from the narcosis, when he is rendered more suggestible, gains a feeling of well-being and shows more confidence toward people in his environment, is an equally important factor.

The results reported from the use of prolonged narcosis seem to justify the use of this procedure in selected cases in which the psychosis does not respond to other means of therapy. When one studies in detail the pathologic findings resulting from barbituric acid poisoning, it becomes apparent that there is some permanent damage to most of the parenchymatous tissue

42. Maloney and Tatum.[27] Maloney, Fitch and Tatum.[29a]

43. Palmer, H. D., and Paine, A. L.: Am. J. Psychiat. **13**: 143 (July) 1933.

44. Hackfeld, A. W.: A Combination Therapy of Induced Narcosis and Fever, Arch. Neurol. & Psychiat. **28**: 1169 (Nov.) 1932.

45. Bleckwenn.[36a, 36b]

of the body. Fortunately nature has been generous enough to supply most of the organs with sufficient tissue so that the clinical results in most cases are negligible. If the procedure is carried on for a long period or is repeated a number of times in the same patient, it is conceivable that function may be permanently impaired.

The phase of increased cooperation usually encountered when a patient is emerging from deep narcosis can also be produced by the administration of small doses of the shorter acting drugs without producing narcosis.[12] The intravenous administration of from 3 to 5 grains (0.2 to 0.3 Gm.) of sodium amytal usually produces a striking change in the attitude and reaction of the patient. A similar change, though less striking, may also be brought about by giving from 3 to 6 grains (0.2 to 0.4 Gm.) by mouth before meals when the stomach is empty.

I have treated thirty-seven patients by the administration of small doses of sodium amytal. Almost without exception I was able to obtain better cooperation from negativistic patients for a period of from several minutes to several hours after the administration of the drug. The administration of the drug was continued in doses large enough to maintain this stage of cooperation for a variable length of time, ranging from several days to three or four weeks in the majority of cases.

During the time the patient was under the influence of the drug, psychotherapy in the form of reassurance and suggestion was employed. In seventeen of these cases, improvement was shown from the time that the drug was first administered. Fourteen of the patients continued to improve, but five left the hospital before they had recovered; nine made complete recoveries. In three the psychosis again became stationary, but at a higher level than before the treatment was started. In twenty cases the patients again regressed to their former level following the initial period of cooperation, and the treatment was discontinued.

Irrespective of diagnosis, I found that by studying the ideational content of these patients while under the influence of sodium amytal, they could be divided into three general groups. In group one the outstanding feature of the ideational content was extreme autistic thinking. In these patients the psychosis centered largely around themselves with no concern about their environment. Some of these were depressed and complained that they had committed terrible sins. They expressed no ideas of punishment, nor did they think that their sins would cause any trouble or discomfort to others. They showed no concern about their environment. Others thought that people in their environment would also suffer for their sins, but they were not particularly concerned about this. They were chiefly concerned because they had committed some moral wrong. In others of this group, the ideational trend was directed primarily toward the body, with ideas of disease or bodily changes, but again with little concern regarding their environment. There were nine patients in this group; two (22.2 per cent) showed slight improvement, but seven (77.7 per cent) showed no change other than the transient period of cooperation while under the influence of the drug.

The second group consisted of six patients whose preoccupations were directed primarily toward their environment, but whose ideational trend indicated that they were not in the least threatened by their environment in their present state. Several of these patients were somewhat amused by things that happened about them, but their affective reaction was somewhat shallow. Others talked about plans for the future in a way that could not be considered expansive, but at the same time expressed an undue confidence in themselves. Nothing in their environment seemed to threaten them in the least. Of these six, none recovered. Only one (16⅔ per cent) showed slight improvement, and five (83⅓ per cent) showed no improvement.

In the last group, consisting of twenty-two patients, the outstanding characteristics seemed to be the decided threat which their environment held for them. Some of these patients were depressed, but, as contrasted with the first group, they were more concerned about the punishment which they might receive from their associates, while the moral issue of their preoccupations seemed to be secondary. Others showed no evidence of depression but felt quite inadequate and insecure in their environment, while still others showed rather definite paranoid trends. This group responded quite well to treatment; fourteen showed improvement as soon as the treatment was started, nine (40.9 per cent) made complete recoveries, and five (22.6 per cent) left the hospital before recovery was complete. Eight (36.3 per cent) showed no improvement.

This short series of cases seems to indicate that the increased feeling of security and the increase in cooperation produced by small doses of sodium amytal may interrupt the course of a psychosis and hasten recovery. The treatment seems to be particularly suited to those patients who feel that their environment is threatening their welfare.

CONCLUSIONS

1. Though usually employed for their sedative action, the barbiturates influence almost every system of the body, and their various side actions should be considered in relation to the general condition of the patient.

2. The longer acting drugs are eliminated slowly, and the cumulative effect of long-continued usage may lead to a delirious reaction or to other toxic symptoms.

3. The psychologic reactions, which are readily induced by the shorter acting drugs, usually help in gaining cooperation from the patient and may aid in interrupting the course of a psychosis and hasten recovery.

4. If the drug is given over a long period, the histologic changes produced by the administration of large doses may lead to permanent impairment of function.

ABSTRACT OF DISCUSSION

DR. W. J. BLECKWENN, Madison, Wis.: Being in a great measure responsible for the intravenous use of barbiturates in neuropsychiatry, I feel justified in reporting work covering a period of five years, during which more than 10,000 intravenous injections have been made. Practically all of the short and long action barbiturates have been studied, and sodium amytal has been the most desirable of the barbituric acid derivatives now available. The following early conclusions have stood the test of time: 1. A prompt and prolonged hypnosis and narcosis can be obtained in all psychotic individuals. 2. A controlled hypnosis for psychologic study can easily be developed in any psychiatric case. 3. A restoration of a normal sleep cycle in acute excitements enhances the rapid recovery in these cases. 4. The exhaustion states associated with acute toxic conditions, which are often fatal, can be avoided by periodically induced narcosis. 5. Convulsions associated with tetanus, eclampsia, strychnine poisoning and status epilepticus can be completely controlled. 6. The method as to dilution and rate of injection and criterion of dosage in each individual case, described in my first communication, is of

paramount importance. All the disturbing untoward reactions with the great fall in blood pressure are thereby avoided. 7. Intravenous barbiturate therapy is hazardous in cases presenting advanced arteriosclerosis, myocarditis and severe hypertensions. 8. In spite of favorable reports, I am opposed to narcosis prolonged for several days. The abnormal metabolism and body chemistry over a prolonged period will not enhance a restoration of normal cellular function. I believe that the production of a narcosis which more simulates the normal sleep cycle is of greater value. Several publications from members of our group are being made establishing the following additional facts: 1. A method of chemical psychoanalysis. 2. A method of investigation in criminal cases. 3. The intravenous use of coramin, caffeine, and epinephrine as an antidote in barbiturate necrosis and the control of the depth of hypnosis induced by sodium amytal by the same drugs. I wish to warn against the general use of barbiturates as practiced. A perfectly good series of drugs can be abused by being employed in every conceivable condition. They are toxic, they are not analgesic, and they have a limited usefulness. They should be used only in conditions in which they are known to be beneficial. My only criticism of this excellent presentation is the author's criterion of dosage, in that he advocates starting with the dosage recommended by the manufacturer. I believe that the individual dose must be established in every case.

DR. WALTER FREEMAN, Washington, D. C.: At St. Elizabeth's we have been using sodium amytal for the purpose of bringing our catatonic patients back into contact with reality. In their catatonic state they are inaccessible and one cannot carry out any satisfactory therapeutic procedure beyond the physical ones. Sodium amytal renders them accessible, so that they can discuss their problems and so that the physician can apply the proper therapeutic measures.

DR. ALEXANDER B. MAGNUS, Chicago: Dr. Bleckwenn's assertion that the Wisconsin group was pioneering in prolonged sleep therapy does not exactly correspond with the history of sleep therapy. To Klaesi, who in 1920 systematized the method of producing prolonged sleep, credit goes for the work in modern psychiatry. As a matter of fact, instances of cures through the induction of a state of stupor in mental patients have been described in the literature since 1870. Bleckwenn, of course, is credited with having started the use of sodium amytal a few years ago. In 1928 I had the opportunity of observing the work of Lutz in Zurich in prolonged sleep therapy with dial and morphine-scopolamine combination. I have since followed this method with some modification. Since the work of Klaesi a number of barbiturates have been tried, most of them meritorious but all of them possessed of some disadvantages. Dial may be classed as one of the slow acting drugs, but I do not fully agree with the objection to the slow acting drugs in narcosustained therapy. The slower or more rapid action is not indicative of the property of the drug as much as of the method of administration. In my work alcoholic and drug addicts and borderline and psychiatric cases were treated. The former were treated for four or five days and the latter two groups for ten days. If properly used and under careful nursing supervision, I consider dial therapy safe. The urinary reduction is frequently encountered. Even if the drug is given in small doses, the average patient will have between three and ten reductions in ten days. Catheterization therefore sometimes becomes a routine procedure. The next important complications to guard against are bronchopneumonia and shock. It would seem that the drug affects directly the capillaries of the bronchial tubes leading to a certain amount of congestion. Preexisting pulmonary conditions, acute or chronic, are important contraindications to the use of barbiturates.

DR. CARL P. WAGNER, Hartford, Conn.: I have found sodium amytal the most effective of the drugs. My policy has been, when administering the drug by mouth, to start with the dosage recommended by the manufacturer and then to increase it or decrease it depending on the reaction of the patient. This problem presents itself if the drug is given intravenously, because the action of sodium amytal is so rapid that one can determine how much to give while the needle is still in the vein. Frequently it is not necessary to give more than 1½ grains (0.1 Gm.) or perhaps 2 grains (0.13 Gm.) of sodium amytal to get the desired response. As an antidote for barbituric acid poisoning I have used coramin but have not had the degree of success described by Dr. Bleckwenn. I used it intramuscularly rather than intravenously. Of course, in the scale of toxicity that has been worked out by Dr. Barlow, dial comes well down the scale as being a relatively nontoxic drug. I prefer to use the shorter acting drugs because I can get the peak of reaction in a short time. When the longer acting drugs are used, the maximum reaction does not occur for an hour or two hours after the drug has been given. This is not the case with the shorter acting drugs. They enable one to control patients a little better although they may be a little more toxic than dial. It was stated that the principal toxic effect of the barbiturates has been on the respiratory system. This is quite true. I have had some experience with the toxic effect on the heart. In one instance a woman, aged 60, with a blood pressure of 140 systolic and 80 diastolic, received 1½ grains of nembutal and developed an auricular fibrillation. In regard to respiration, I might add that with the use of the longer acting drug the reaction that has been described as most typical is that of pulmonary congestion and edema, which may terminate fatally. The shorter acting drugs act more directly on the respiratory center and cause death rather suddenly. I have never seen an instance of addiction to barbiturates in the same sense that one becomes addicted to morphine. Patients do develop a tolerance for barbiturates, and the use of barbiturates becomes a habit like a good many other things. They can be withdrawn without severe withdrawal symptoms.

COLPECTOMY

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Colpectomy is an operation which has fallen into an undeserved oblivion in this country largely because it involves the complete anatomic and physiologic loss of the vagina. However, simplicity of performance, safety, uniformly good results, and applicability to conditions not amenable to any of the reconstructive types of operation insure for it a permanent place among useful surgical procedures.

LITERATURE

In Europe, colpectomy enjoys considerable popularity; in America it is seldom employed and the indications for the operation as well as the technic of the procedure and its modifications have received scant mention in the literature. Procedures more extensive and much less uniformly satisfactory are sometimes attempted in patients in whom colpectomy is definitely indicated.

Le Fort[1] in 1876 first described the central type of partial colpectomy for prolapse. His patient, aged 48 years, had a marked prolapse. He performed central colpectomy only at first and obtained a satisfactory result, but he noted relaxation of the perineum and in order to prevent any possible recurrence he subsequently performed a perineal repair. Earlier attempts to treat prolapse of the uterus surgically consisted in narrowing the vaginal orifice anteriorly or posteriorly or in closing the orifice by suturing together the labia. These methods were all unsatisfactory and resulted usually in recurrence.

Read before the Section on Obstetrics, Gynecology and Abdominal Surgery at the Eighty-Fourth Annual Session of the American Medical Association, Milwaukee, June 16, 1933.

1. Le Fort, Léon: Nouveau procédé pour la guérison du prolapsus utérin, Bull. gén. de thérap. 92: 337, 1877.

In the French literature, Brocq and Nora,[2] Dieulafé,[3] Dujarier,[4] Laurentie [5] and Petit-Dutaillis [6] among others make the operation the subject of complete discussions.

Payne [7] credits Simon with the original use of total colpectomy in 1885 for intractable vesicovaginal fistula.

In American literature, little reference is made to colpectomy. Baer and Reis [8] report 14 colpectomies in 212 operations, and Phaneuf [9] 13 colpectomies in 183 operations for prolapse of the uterus. Others [10] have merely mentioned the operation in a general discussion of prolapse and usually assign it a negligible place among useful surgical procedures.

INDICATIONS

1. Prolapse in the aged constitutes the most frequent indication for colpectomy. In old and debilitated women in whom a short intervention under local anesthesia alone is feasible, this operation offers a maximum chance for cure with little or no risk.

The onset of sexual old age in the female cannot be accurately defined in years. Certainly there could be little objection made to the loss of the vagina after the age of 70, and the menopause would probably mark the limit below which the operation would be contraindicated except under very unusual circumstances. Between these limits the selection of this operation would depend on the social status of the patient, her physical condition, the feasibility of performing some more conservative procedure, and finally, but not of least importance, on the consent of the patient herself after all aspects of the operation have been carefully explained to her.

2. After hysterectomy the recurrence of prolapse with cystocele or rectocele, or both, is tremendously difficult to treat. Fortunately, such recurrences have been encountered with relative infrequency since the abandonment of hysterectomy alone, either abdominal or vaginal, for the treatment of prolapse. Supplemented by adequate reconstruction of the pelvic supports, abdominal and vaginal hysterectomy seldom result unfavorably when used within their limitations in the treatment of prolapse.

When preservation of the vagina is a very important consideration, this type of recurrent prolapse may sometimes be successfully treated by the Payne [7] operation or by fixation of the dome of the vagina either into the abdominal wall as described by Sloan [11] or into the pelvic wall on one side as in the Knapp [12] operation, supplemented in either instance by anterior and posterior colporrhaphy. Often, however, and especially in older patients, or when other perineal operations have been performed unsuccessfully previous to hysterectomy, the anatomic structures are so distorted and inadequate that any operation less certain than colpectomy to result in cure would be inadvisable.

3. Recurrences after the Watkins-Wertheim interposition operation for prolapse and cystocele may sometimes be best handled by hysterectomy and colpectomy.

4. Vaginal hernia is rare but should be considered in all cases of prolapse and whenever a mass bulges into the vagina. Phaneuf,[9] Ward,[13] Douglass [14] and others state that vaginal hernia is present with prolapse much oftener than is thought and that it is among the most common causes of recurrence after operations for prolapse; others hold that it occurs very infrequently.

Uncomplicated vaginal hernia may be successfully treated by conservative operation.[15] When the hernia recurs after hysterectomy, when intra-abdominal operations are contraindicated on account of age or for other reasons and the hernial defect is too great to be repaired by conservative vaginal procedures, or when the hernia is large and is a part of an extensive prolapse, total or partial colpectomy after ligation of the sac is often the procedure of choice or the only alternative that offers a reasonable prospect of cure.

5. When vaginal hysterectomy is performed for prolapse, efficient reconstruction of the perineum may be impossible on account of marked atrophy or extensive destruction of tissues: if there is not sufficient contraindication to vaginal obliteration, colpectomy as an adjunct is preferable to a perineal reconstruction which would offer little prospect of permanent cure.

6. Prolapse in nulliparous women is often the result of congenitally defective perineal structures. When effective repair cannot be accomplished, or after the failure of conservative surgical procedures, as in Shoemaker's [16] patient, colpectomy may be necessary.

7. Payne [7] states that intractable vesicovaginal fistula was treated by Simon in 1885 by colpectomy. Modern methods of handling these conditions largely preclude the necessity for colpectomy.

8. Vaginal neoplasm is a rare condition: when its surgical treatment involves a very extensive denudation of the vagina, complete or partial colpectomy may be useful.

TYPES OF OPERATION

Colpectomy may be total or subtotal.

Subtotal Colpectomy.—The operation described by Le Fort [1] is the classic procedure of this type. It was devised for the treatment of prolapse, the uterus being left in place. It provides for the drainage of the secretions from the uterus and cervix by the formation of a transverse cavity beneath the cervix, which communicates at each end with two laterally placed canals leading to the surface at the vaginal orifice. Such provision for permanent drainage is essential in all cases in which the uterus is left in place, even when the menopause has been passed.

In the Le Fort operation two rectangular areas, one on the anterior and one directly opposite on the poste-

2. Brocq, P., and Nora, G.: Le traitement du prolapsus utero-vaginal total chez les femmes âgée par l'operation de Le Fort élargié, Gynéc. et obst. **11**: 338-355 (May) 1925.

3. Dieulafé, M. L.: Prolapsus génital total, chez une femme tres âgée, traité par l'operation de Le Fort, Bull. Soc. d'obst. et gynec. **18**: 674-675 (Nov.) 1929.

4. Dujarier, Charles, and Larget, M.: Technique opératoire de la colpectomie totale dans le prolapsus complet des femmes âgées, J. de chir. **25**: 283-294, 1925.

5. Laurentie: Traitement du prolapsus génital complet chez les femmes âgées, Gynéc. et obst. **15**: 379-381, 1927.

6. Petit-Dutaillis, Paul: Modifications au procédé de choissonement vaginal de Le Fort, Gynecology **20**: 152-159 (March) 1931.

7. Payne, R. L.: Genital Prolapse Following Total Hysterectomy, Arch. Surg. **20**: 637-642 (April) 1930.

8. Baer, J. L., and Reis, R. A.: Immediate and Remote Results in 212 Cases of Prolapse, Am. J. Obst. & Gynec. **16**: 646 (Nov.) 1928.

9. Phaneuf, L. E.: Vaginal Operations in the Treatment of Uterine Prolapse, Cystocele and Rectocele, with Special Reference to the Interposition Operation, New England J. Med. **201**: 875-880 (Oct. 31) 1929.

10. Masson, J. C.: Surgical Treatment of Uterine Prolapse, Minnesota Med. **12**: 67-70 (Feb.) 1929. Frank, R. T.: The Treatment of Cystocele, Rectocele and Uterine Prolapse, Am. J. Obst. & Gynec. **5**: 8-12 (Jan.) 1923.

11. Sloan, E. P.: Results of Radical Surgical Treatment of Procidentia by the Murphy, Collins and Jackson Operations, Am. J. Obst. & Gynec. **7**: 703-708, 721-722 (June) 1924.

12. Knapp, D. R.: Prolapse Following Hysterectomy, Northwest Med. **27**: 226-228 (May) 1928.

13. Ward, G. G.: Technic of Repair of Enterocele (Posterior Vaginal Hernia) and Rectocele, J. A. M. A. **79**: 709-712 (Aug. 26) 1922.

14. Douglass, F. M.: End Results of the Vaginal Hysterectomy and Watkins-Wertheim Interposition Operation in Procidentia, Ohio State M. J. **23**: 983-985 (Dec.) 1927.

15. Masson, J. C., and Simon, H. E.: Vaginal Hernia, Surg., Gynec. & Obst. **47**: 36-41 (July) 1928.

16. Shoemaker, G. E.: Treatment of Procidentia in the Nulliparous, Surg., Gynec. & Obst. **31**: 534 (Nov.) 1920.

rior wall of the vagina, are completely denuded of mucosa. The upper limit of each rectangle should not extend beyond a point 2 cm. below the cervix; the lower limit posteriorly corresponds to the mucocutaneous junction; anteriorly it extends nearly to the urethral opening. The width of each rectangle should be such that the mucosa remaining on each side will form a canal approximately 1 cm. in diameter. Bleeding is carefully controlled and the denuded rectangles are then accurately apposed and sutured together from above downward with interrupted catgut sutures. A few strands of silkworm sutures are used for a drain. After the operation is completed, fluid injected into either of the lateral canals should pass upward, across the subcervical space, and escape through the canal on the opposite side. A perineal repair when indicated should be performed as a part of the colpectomy. A curettement and any cervical treatment indicated should be performed first.

Total Colpectomy.—When the uterus has been removed previously or coincidentally with the operation, provision for drainage is not necessary and the entire vagina may be obliterated.

In the technic described by Dujarier and Larget [4] and others, a vertical midline incision is made through the vaginal mucosa, from just beneath the urethral meatus, extending over the vaginal dome and down the posterior wall to the midfourchette. The vaginal mucosa is completely removed laterally and the cavity obliterated by suturing together the anterior and posterior walls. A small rubber tube or bundle of silkworm sutures provides drainage from the upper portion of the cavity to the surface.

Numerous objections may be made to this method of total colpectomy:

1. It does not include reconstruction of the perineum, a step very essential for maximum support, as was pointed out by Phaneuf and Brocq. Without reconstruction of the perineum, the direction of the vaginal scar is directly downward; with perineal repair, the direction is more nearly horizontal and provides maximum resistance against intra-abdominal pressure.

2. The lateral fascias and remnants of the uterine ligaments are not utilized to support the bladder, which is allowed to sag back against the rectum. The approximation of the anterior to the posterior wall of the vagina is in the direction of the weakest structures and does not utilize the much stronger and heavier tissues of the lateral walls.

3. The removal of the vaginal mucosa in the directions made necessary from the type of incision employed does not provide maximum ease and accuracy of separation and is opposite in some portions to that which is familiar to the surgeon.

It should be emphasized, therefore, that perineorrhaphy is an essential step when the perineum is deficient and it is suggested that partial anterior and posterior denudation with anterior and posterior reconstruction be done first, then the denudation completed and the cavity obliterated. The operation as modified is not deprived of its simplicity to any appreciable extent and it is made much more efficient.

MODIFIED TOTAL COLPECTOMY

1. Under sacral anesthesia a vertical incision is made through the vaginal mucosa from just beneath the urethral meatus and extended well above the cystocele. The vaginal mucosa is elevated well laterally and two or three sutures are deeply placed to bring the lateral tissues across beneath the urethra and lower part of the bladder.

2. The posterior vaginal mucosa is elevated, and the levator muscles and adjacent tissues are exposed and sutured together as in the usual perineorrhaphy.

3. The remaining vaginal mucosa is then removed down to the mucocutaneous junction. In the presence of marked cystocele the ureters will drop well downward and backward but will not be easily injured if their altered position is borne in mind. Opening of the culdesac, which may occur at this time, is without danger. Bleeding is accurately controlled by ligatures and hot packs.

4. The cavity is obliterated from above downward by a series of sutures of doubled heavy chromic catgut. They are placed deeply in the lateral structures and include only a very superficial bite in the anterior and posterior walls as they are passed across them. The ureters should be carefully avoided in placing the upper sutures. When these sutures are tied, the lateral walls are approximated.

5. Drainage is very essential to prevent the accumulation of blood within the cavity. Such an accumulation produces an elevation in temperature and pain, and as it dissects downward to the surface it weakens the scar. This drainage is provided by a small tube or a bundle of silkworm sutures extending well up into the top of the cavity. It is left in place for eight or ten days.

6. After the vaginal cavity is obliterated down to the mucocutaneous junction, the mucocutaneous edges are accurately approximated; the drain is allowed to pass out posteriorly or in the midportion. A retention catheter may be left in the bladder for ten days.

Results of Total and Subtotal Colpectomy Reported by Eight Operators

	Number of Cases Reported	Deaths	Number of Patients Followed Up	Recurrence
Baer and Reis [8]	14	0	10	0
Brocq and Nora [2]	28	0	9	0
Dieulafé [3]	1	0	1	0
Dujarier [4]	15	0	15	0
Laurentie [5]	8	0	8	0
Mombarch [*]	1	0	1	0
Phaneuf [6]	13	0	13	1
Simon	2	0	2	0
Totals	92	0	59	1

[*] Mombarch, G.: Etiology and Treatment of Prolapse of the Uterus and Bladder, Ohio State M. J. 16:416-418 (June) 1920.

RESULTS

In a series of ninety-two patients on whom various types of colpectomy had been performed by eight different operators, there were no deaths, as shown in the accompanying table. A postoperative hemorrhage occurred in one patient reported by Laurentie and a hemotoma in one of Dujarier's patients. One of Phaneuf's patients developed a low grade infection and accounted for the only recurrence in fifty-nine patients who were followed up.

These results are particularly striking when the advanced age and the poor physical condition of most of these patients is considered and in view of the results obtainable by any other type of operation.

SUMMARY AND COMMENT

1. Colpectomy is an operation which is easily performed, yields uniformly good results and is safe. Its

greatest objection is that it involves the functional loss of the vagina but when this is a lesser or not a serious consideration, it is an operation which insures good results with minimum risk in a number of conditions not readily amenable to less radical procedures.

2. Colpectomy may be subtotal, as in the Le Fort operation, which permits the uterus to be left in place, or total if the uterus is removed.

Simple denudation of the vaginal mucosa and approximation of the anterior to the posterior walls does not provide the most satisfactory operation for total colpectomy and does not accomplish maximum strength for the repair. The inclusion of anterior and posterior colporrhaphy and utilization of the strong lateral tissues for support are of importance.

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ABSTRACT OF DISCUSSION

DR. J. C. MASSON, Rochester, Minn.: I am satisfied that colpectomy is utilized, probably in a haphazard or modified manner, much more frequently than the literature would indicate. I frequently have seen large postoperative vaginal hernias that had followed abdominal or vaginal hysterectomy. Adequate support had not been provided at the vault of the vagina, and in many cases no attempt had been made to repair an extensive laceration of the perineum. In many of these cases, any attempt at reconstruction means partial vaginectomy or colpectomy. If the vault of the vagina is fixed into the anterior abdominal wall or to the side of the pelvis, the condition will be helped only temporarily. There will be a definite tendency toward recurrence of the cystocele, if the patient is much on her feet. Most of the patients are well past the menopause, and on account of the unnatural dryness and thickening of the vaginal mucous membrane, from exposure and irritation for many months, sexual relations have not been satisfactory and in most cases have been entirely discontinued. The patient raises no objection to radical operation provided there is a reasonable certainty that relief can be obtained from the uncomfortable bearing-down feeling, protrusion of the parts, irritable bladder, and difficulty in emptying the lower part of the bowel. The patient and her husband, however, should thoroughly understand, before the operation is undertaken, what the postoperative condition will be. The operation is also indicated in many cases of procidentia of elderly women. It must be remembered that many patients who are 70 years of age are going to live at least ten more years. The operation can be done more quickly and more safely, and will result in more relief to the patient, than so-called less radical operations that require extensive plastic procedures, or abdominal incisions and the long continued use of a pessary. I have had no experience with the Le Fort procedure, but if patients are averse to losing any of their organs, if the case is one of virginal prolapse as a result of congenital weakness of the muscles of the pelvic diaphragm, or if the patients do not contemplate marriage, it might be satisfactory. I think, however, that complete colpectomy, as advised by Dr. Simon, is a better operation and has much to recommend it. The operation can be done satisfactorily in conjunction with application of the Mayo principle of giving support to the bladder after removal of the uterus, and in conjunction with high approximation of the levator ani muscles before the attempt is made to obliterate the vaginal canal. I should like to add here, however, that the reason for postoperative hernias and for recurrence of cystocele and rectocele following the Mayo type of operation is generally the result of the surgeon's not having taken sufficient pains to anchor the approximated anterior ends of the broad ligaments under the symphysis pubis and to effect partial obliteration of the culdesac and shortening of the uterosacral ligaments. If general anesthesia is contraindicated, this operation can be done with a minimum amount of risk under low spinal anesthesia, sacral block, or local infiltration. If advisable, patients can be allowed to be out of bed in about half the time necessary following the more frequently used operations.

THE PREVENTION OF COMPLICATIONS IN THYROID SURGERY

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The prevention of complications, both immediate and remote, following thyroidectomy is a subject of extreme importance to those interested in thyroid surgery. The statistical study of operative records reveals the number of patients who were successfully operated on, but it tells nothing of the patients whose lives perhaps hung in the balance for hours or days. An error in judgment either at the operating table or later may be responsible for the development of complications that greatly alter mortality statistics. Although such a mistake may not result in the death of the patient, it may change his whole future health and welfare.

In perhaps no field of surgery are complications more prone to develop than following operations on the thyroid. This is so true that there are few surgeons who have not experienced most of the unfortunate sequelae at some time during their careers. It has been my misfortune to have run the gantlet and, fortified with this knowledge and experience, I offer the following suggestions:

Complications following thyroidectomy may be divided into three classes: immediate, delayed and remote.

In the first group, immediate complications, are found those accidents which occur at the operating table; they may be listed as follows:

1. Injury of the recurrent laryngeal nerve.
2. Hemorrhage.
3. Injury or collapse of the trachea.
4. Air embolism.
5. Acute hyperthyroidism.
6. Anesthesia complications.

The second group, delayed complications, is as follows:

1. Tetany.
2. Hemorrhage.
3. Hyperthyroidism.
4. Tracheitis.
5. Pneumonia.
6. Cardiac failure.
7. Wound infection.
8. Temporary nerve involvement.
9. Tracheal obstruction.
10. Anoxemia.
11. Hematoma of wound.
12. Mania and psychosis.
13. Shock.
14. Glycosuria.
15. Embolism.

The third group, remote complications, includes:

1. Persistent hyperthyroidism.
2. Recurrent hyperthyroidism.
3. Cardiac failure.
4. Tetany.
5. Skin adhesions.
6. Hypothyroidism and myxedema.
7. Progressive exophthalmos.

Obviously, in this short dissertation, it is impossible to dwell in detail on any save the most important of these problems.

IMMEDIATE COMPLICATIONS

1. During the past four years it has been my good fortune to have avoided successfully injury to the recurrent laryngeal nerve. Few surgeons performing any number of thyroidectomies have avoided injuring one or even both nerves at some time in their experience.

From the Jackson Clinic.
Read before the Section on Surgery, General and Abdominal, at the Eighty-Fourth Annual Session of the American Medical Association, Milwaukee, June 14, 1933.

The most frequent causes of this in their order of importance are: the placing of hemostats too low on the lateral borders of the gland, and, likewise, on the lower poles; too great haste; a wet operative field obscured by numerous hemostats; substernal and intrathoracic goiters with distortion of the anatomy, and ligation of the inferior thyroid artery too close to the gland. The greatest care should be used in placing hemostats on the lower lateral and inferior poles preparatory to resecting the gland. Probably, however, the majority of nerve injuries occur after the surgeon has begun resecting the gland, particularly in that type which is extremely friable and vascular. In an effort to secure hemostasis, the friable gland crumbles away and a comparatively simple operation suddenly becomes a serious one. Hemorrhage must be controlled and, at the same time, injury to the nerve avoided. The failure of the surgeon to place his hemostats sufficiently high on the lateral walls at the start accounts for the majority of complications in thyroid surgery. If the gland is resected from within, leaving only a thin but sufficiently deep outer shell, not only will nerve injury be avoided but hemorrhage from within the capsule can always be controlled.

2. The most frequent cause of serious hemorrhage results from the tearing of the lateral or middle thyroid veins in elderly persons with substernal goiters. Experience teaches one to be on guard for this dangerous sequela. As soon as possible these veins should be isolated and, if necessary to elevate the goiter, they should be ligated and divided at once. The method of running the index finger down along the lateral and inferior border of the goiter in order to free adhesions and to elevate the goiter should be avoided, as occasionally a friable vein will be caught and torn by the finger. Rather the goiter should be elevated by careful traction, the capsule being dissected with the scalpel, and the veins being ligated as they are encountered. If three hemostats are placed on the superior thyroid artery and vein and they are divided between the second and third and immediately sutured with number two plain gut, these vessels will cause little concern. Serious bleeding from within the capsule can be controlled with the index finger pressing upward and inward along the lateral border of the gland.

3. Injury to or collapse of the trachea is seldom serious and may be avoided by careful and not too rapid dissection in a dry field. In our clinic, two fatal cases of collapse of the trachea occurred preoperatively within the past year. This was a most unusual and new experience, but it proved to me that such complications may occur following operation and are not necessarily dyspnea resulting from nerve injury. In one of our cases the trachea collapsed a few minutes after the patient was admitted to the hospital and before a tracheotomy could be performed. The other occurred on the table just before operation, and although tracheotomy was performed at once, the patient lived only a few hours. Both patients had large intrathoracic goiters.

4. I have seen four cases of air embolism, two of which occurred in my service, with a single recovery. As one patient was being taken from the operating room, she suddenly coughed violently and tore loose a ligature on the anterior jugular vein. Although the dressing was immediately removed and the wound reopened, she died in a few seconds. The second case occurred while an attempt was made to locate the source of a delayed hemorrhage. In this instance the patient's head was immediately lowered and oxygen with carbon dioxide administered. She remained unconscious for seven hours and recovered with a partial hemiplegia that later cleared up. The absence of valves in the thyroid veins and their tendency to remain patent makes it important to ligate every vessel carefully.

5. Acute hyperthyroidism on the table was a common complication before 1922 but has been rare since the advent of compound solution of iodine. Proper preoperative preparation should avert it, but if it occurs the operation should be stopped and the patient brought under control with iodine, ice bags and fluids in his room.

6. It has been my good fortune to have had but one serious complication that I might attribute to the anesthetic; this was in a case of pneumonia. Some years ago procaine hydrochloride reactions occasionally occurred, but with the development of the superficial nerve block method and with the preoperative use of 10 grains (0.6 Gm.) of sodium barbital this complication has been eliminated.

DELAYED COMPLICATIONS

During the past seven years I have not seen a case of tetany. Experience taught me that tetany as well as nerve injury resulted largely from dissecting too far down the lateral walls of the gland. Leaving a sufficient shell of gland and capsule will prevent tetany.

Delayed hemorrhage may occur as late as one month following operation and is usually the result of a low grade wound infection. Hemorrhage the second or third day, however, is the result of improper hemostasis.

Sufficient iodine by mouth, by duodenal tube, by rectum or by vein, fluids, ice bags, sedatives, oxygen, good nursing and psychology will usually control hyperthyroidism.

Tracheitis is prevented by careful operative technic in avoiding trauma of any sort to the trachea and by the use of a steam tent, codeine and atropine. In elderly persons it is safer to perform a two-stage operation.

Cardiac failure remains the most serious sequela in long-standing cases of toxic adenoma and exophthalmic goiter. The controversy still persists as to whether digitalis does harm or good in the preparation and after-care of the former. Some of us believe that we have saved many lives with digitalis; Plummer and others feel they have saved lives by not using it.

Wound infection, when it occurs, is most annoying because it may take weeks to clear up. Fortunately it is rare and in my experience is less often seen when no drainage tube is used. Allowing serum to collect for a day or two without probing will often invite trouble.

Temporary involvement of the nerve may occur as a result of edema of the tissues or trauma, but it is seldom of serious import.

Much could be said about tracheal obstruction and anoxemia and about their prevention and treatment with oxygen therapy. I have saved several critical cases with the oxygen tent or merely by inserting a nasal catheter and connecting it with an oxygen tank.

Mania and psychosis are occasionally serious and even fatal sequelae of thyroidectomy. I know of no way of anticipating or avoiding these conditions, and their treatment is largely that of a psychosis from other causes.

The avoidance of postoperative shock has been ably elaborated on by Crile and needs no further mention here.

All goiter cases should be carefully examined preoperatively for the possibility of glycosuria. Occasionally, a true diabetes but more often an acute glycosuria will be precipitated by thyroidectomy.

REMOTE COMPLICATIONS

I have seen tetany develop as late as eight months after thyroidectomy.

In burned out cases of exophthalmic goiter or in advanced toxic adenoma, cardiac failure is apt to occur in from one to five years following thyroidectomy.

Rarely in this surgical age is postoperative myxedema encountered, although mild grades of hypothyroidism are observed and even desired by some surgeons.

Recurrent hyperthyroidism remains the most frequent and serious remote postoperative complication, or, rather, persistent hyperthyroidism, because this condition usually but not always results from a failure to remove sufficient tissue at the time of the first operation. The frequency of recurrence runs as high as 5 per cent even at the best thyroid clinics. In some instances, several recurrences develop in a single patient.

Sufficient time has not yet elapsed, but during the past three years I have found a method that more nearly solves this problem of recurrence than any other that I have yet tried. With but a single recurrence during this period I have not been tempted to consider denervation of the suprarenal glands, as advocated by Crile. The advent of electrosurgery has in my opinion revolutionized the technic of thyroidectomy. Not only is it possible to remove more thyroid tissue with a greater degree of safety than with the scalpel, but it is possible to coagulate all but a small fraction of the remaining gland, thus producing fibrosis and scar tissue and permanence of cure. Strangely enough, myxedema does not develop, but the patient proceeds to a normal convalescence with greater rapidity.

To prevent persistent and recurrent hyperthyroidism, a careful postoperative regimen should follow, with iodine for six months, high caloric diet, permanent restraint from stimulants and proper rest. Likewise, in all cases of exophthalmic goiter, septic tonsils if present should be removed some months after thyroidectomy. Electrosurgery, however, has been the most important factor in overcoming this most serious indictment of thyroid surgery.

CONCLUSION

One cannot improve on the words of Dr. Charles Mayo, who stated that exophthalmic goiter should never be considered as an emergency operation. Thus, with a careful preoperative preparation and with the avoidance of undue haste in operating, the majority of complications in thyroid surgery will be prevented.

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ABSTRACT OF DISCUSSION

DR. ROBERT S. DINSMORE, Cleveland: There are several well established facts about thyroid surgery. There has been established a low mortality rate in all large thyroid clinics. Generally speaking, the results of thyroid surgery are excellent. There is, however, as Dr. Jackson has pointed out, a low residual morbidity rate which can be markedly lowered by the prevention of complications. Dr. Jackson has divided these into three groups, and I feel that by far the most important are the early or the immediate complications. If one avoids a postoperative hemorrhage or injury to the recurrent laryngeal nerve or parathyroid bodies, the morbidity rate will be fairly low. In case of severe hemorrhage, one should take the operating team back, give the patient a light anesthetic, and carefully enucleate the hematoma. The most distressing type of postoperative hemorrhage is one that comes from the inferior thyroid artery following the removal of an intrathoracic goiter. If after the removal of a large intrathoracic goiter a fixed cavity is formed, the case should be treated by a secondary closure. It is quite true that most of these cavities are quickly obliterated by the lungs and the pleura, but occasionally a large cavity extending well down into the chest will result. Extravasation or venous oozing into this cavity may take place with no outward or visible symptoms in the neck. The patient, however, will become very pale, the pulse will become very rapid, and there will be a slight widening of the mediastinal dulness. The extravasation may extend into the posterior or anterior mediastinum, but almost invariably the result is fatal. The heart simply becomes strangulated. There is another rare type of postoperative hemorrhage that is occasionally seen. On the third or fourth day after a thyroidectomy, the patient may develop a slightly brassy character to the voice, and the laryngeal examination will show an extravasation into one of the cords. This is not a complication that causes any trouble, as it usually clears up in a few days. I have had less trouble with the recurrent laryngeal nerves in cases in which I have dissected the gland from the outside, placing the clamps on the lower pole so that they stand erect in the wound, and placing the clamps on the superior pole from within outward. Dr. Jackson mentioned that the delirium of acute hyperthyroidism should be differentiated from the true manias or the psychoses. In all the cases of major psychoses that I have seen after an operation, the psychiatrist has been able to establish the fact that the patient had a previous psychosis in addition to the hyperthyroidism. The two points of importance about a patient with a major psychosis and hyperthyroidism are, first, that these patients should not be operated on near one of the acute exacerbations, and, second, that a guarded prognosis should be made as to the course of the psychosis. I believe that most of these patients present two separate clinical entities and that the psychosis does not follow the hyperthyroidism but that it is a major psychosis and hyperthyroidism.

INSULIN IN THE TREATMENT OF TUBERCULOSIS

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The work summarized in this paper comprises more than eighty nondiabetic tuberculosis cases. Several New York tuberculosis specialists kindly referred volunteers from their charity services to receive the first treatment in Morristown, and Eli Lilly & Co., furnished insulin for this purpose. A preliminary announcement was previously published.[1] The observations were then extended in two parts, which will be published in detail in separate papers. One of these comprised a series of twenty-six cases studied in the Valley View Sanatorium, Paterson, N. J., in collaboration with Drs. William E. Pottinger, Stephen A. Douglas and Earl Warren. The second comprised forty-five cases observed in the City Hospital, Welfare Island, New York City, in collaboration with Dr. James S. Edlin.

This work was a natural development from certain studies of diabetes. On the practical side, I [2] was apparently the first to publish observations on the use of insulin in diabetic cases complicated with tuberculosis. Numerous authors since then have confirmed the fact that the results in such cases are revolutionized by insulin and the higher nutrition which it makes

Read before the Section on Pharmacology and Therapeutics at the Eighty-Fourth Annual Session of the American Medical Association, Milwaukee, June 13, 1933.

1. Allen, F. M.: J. M. Soc. New Jersey **29**: 335 (April) 1932.
2. Allen, F. M.: J. Metab. Research **2**: 834, 883, 906, 1922.

possible. Historically, the greatest numbers of tuberculosis cases and deaths among diabetic patients occurred under the earlier crude forms of treatment when the sugar was not controlled. The control of the sugar brought some degree of improvement, even though accomplished at the price of undernutrition, but the results nevertheless were highly unsatisfactory and the prognosis was usually bad. The revolution accomplished by insulin treatment has been such that I myself feel that the diabetic patient, properly treated, has a somewhat better chance than the nondiabetic patient with the same degree of tuberculosis. At any rate, the history of diabetic treatment seems to confirm the prevailing views concerning the importance of nutrition for resistance against tuberculosis.

On the theoretical side, I have since 1914 been publishing experimental and clinical evidence to prove that the internal secretion of the pancreas is related not merely to carbohydrate metabolism but to total metabolism and body weight. The first observations, made by comparisons of higher and lower diets, were confirmed after insulin was discovered by showing that the difference between high and low body weights in diabetic patients can be definitely measured in terms of insulin requirement. Reducing the body weight under other-

Chart 1.—Prolonged storage of insulin in a 5.6 Kg. dog receiving one dose of 2,000 units of insulin subcutaneously and successive intravenous injections of 10 Gm. of dextrose.

wise constant conditions reduces the insulin requirement, and any marked increase of body weight is the most powerful means of increasing the insulin requirement. Insulin may therefore be regarded as a specific anabolic hormone. Moreover, the notoriously poor resistance of depancreatized animals and untreated diabetic patients to many infections demonstrates the importance of an adequate supply of insulin for normal resistance. Whether any raising of resistance is possible by a particularly liberal supply of insulin, in other words by administering insulin to nondiabetic patients, is a question to be decided. An analogy may be suggested with the administration of surplus quantities of vitamins for improving the resistance to tuberculosis. There are also reports in the literature favoring the use of insulin for other types of infections.

The first use of insulin for building up weight in nondiabetic patients was by Pittfield,[3] Marriott [4] and Barbour [5] in 1923 and 1924. The first trial of insulin in nondiabetic tuberculosis cases was by Bauer and Nyiri [6] in 1925. Since then a large literature has grown up on this subject. Nearly all the European authors have used insulin in comparatively small doses for comparatively brief "fattening cures." Falta [7] has rendered service in attracting attention to various phases of this subject, though he cannot be credited with priority. The belief has also been widely disseminated that insulin is suitable only for inactive tuberculous cases and that its use is contraindicated by active lesions, fever, hemorrhage and other complications. More recently, some authors have increased the dosage to 60 units a day or more and have extended the treatment either continuously or at intervals over several months. To Leggett and Callahan [8] seems to belong the credit for most definitely breaking away from the old idea of "courses of insulin" and using insulin in dosage suited to the individual need and for the periods that seem individually advisable, sometimes for from three to six months.

As the processes of nutrition are so complex and obscure, theories should not venture far beyond proved facts. Insulin is evidently only one of many factors governing both appetite and nutrition. Hyperinsulinism is not necessarily synonymous with either hunger or obesity. Insulin or hypoglycemia may sometimes be accompanied by nausea instead of hunger. This reversal of rule is commonest in toxic states, but on the other hand some patients with fever and intoxication may respond to insulin with appetite and gain in weight, while some who are not toxic may develop no hunger and cannot be fattened with insulin. Before undertaking the work with human patients it seemed necessary to perform animal experiments concerning the possible toxicity of insulin and also the possibility of keeping the organism enriched with insulin. The observations of previous writers on the former point are not definitive. It is not safe to regard insulin as nontoxic in absolutely unlimited dosage, but, on the other hand, doses much higher than were ever needed in tuberculosis treatment can be given with no bad effects beyond what can be antidoted by moderate quantities of carbohydrate.

Physicians are inclined to regard the effects of insulin as limited to a few hours, but I [9] have shown that, with large dosage, prolonged storage of insulin is demonstrable. Chart 1 illustrates these experiments, which will be reported in greater detail later. When such a small animal as a 12½ pound (5,670 Gm.) dog receives such a large dose as 2,000 units of insulin, protection from hypoglycemic symptoms requires no enormous dosage of carbohydrate but only 10 Gm. at a time. The chief difference is that these protecting doses of dextrose must be continued for a day or two, during which time there is evidently an excess of insulin stored in the body. These experiments illustrate not only the feasibility of artificial hyperinsulinism but also the fallacy of attempted ratios between carbohydrate and insulin, and other theoretical matters. The general principle that the combating of insulin shock depends less on the total quantity of carbohydrate than on the frequency of its administration will be found very valuable practically in the insulin treatment of both diabetes and tuberculosis.

In general, I have administered more insulin than has heretofore been given to nondiabetic persons, in the sense of the size of doses and the length of treatment. One man received 320 units a day with rapid

3. Pittfield, R. L.: On the Use of Insulin in Infantile Inanition, New York M. J. 118: 217-218 (Aug. 15) 1923.
4. Marriott, W. McK.: The Food Requirements of Malnourished Infants, J. A. M. A. 83: 600-603 (Aug. 23) 1924.
5. Barbour, O.: Use of Insulin in Undernourished Nondiabetic Children, Arch. Pediat. 41: 707-711 (Oct.) 1924.
6. Bauer, Richard, and Nyiri, W.: Med. Klin. 21: 1456-1460 (Sept. 25) 1925.
7. Falta, W.: Wien. klin. Wchnschr. 38: 757-758 (July 2) 1925.
8. Leggett, E. A., and Callahan, F. F.: Journal-Lancet 51: 563-570 (Sept. 15) 1931.
9. Allen, F. M.: Proc. Am. Physiol. Soc., 1932.

gain of weight, but this was an exception. Treatment was usually begun with 5 units before each meal and increased to about 40 units three times a day, but individualization should be emphasized as the chief principle. There are individual peculiarities of insulin tolerance. Women are apt to take less than men. Toxic patients usually do not stand as large doses as the nontoxic, contrary to the rule in diabetes. The same individual may differ in his insulin requirement at different times. When small doses are unsuccessful, large doses will sometimes give results and vice versa. When a patient has flourished for several weeks or months on a certain dosage and has perhaps reached

*Blood Sugar Curves Before and During Insulin**

Patient	Sex	Time	P. M.	A. M.	1st Hour	2d Hour	3d Hour
M. T.	♂	Before	126	112	184	105	116
		During	166	126	283	243	136
M. P.	♀	Before	130	101	109	126	122
		During	125	115	178	142	107
W. D.	♀	Before	115	97	108	126	94
		During	103	91	200	195	80
J. R.	♂	Before	142	112	180	195	137
		During	154	123	230	226	109
E. M.	♂	Before	180	107	220	140	133
		During	150	125	226	206	164
I. C.	♂	Before	142	102	0	0	0
		During	108	91	223	173	129

* P. M., one hour after ordinary supper; A. M., fasting. 1st hour, 2d hour, 3d hour, after ingestion of 100 Gm. of dextrose.

normal or slightly more than normal weight, he may begin to show sensitiveness in the form of insulin reactions or nausea and may continue to thrive only after the dose has been cut perhaps in half. The best results require study of such details, also training and skill in this particular method. The administration of insulin has thus been continued over eight months. The kind and quantity of the diet is also planned to suit the individual, but commonly a mixed diet containing liberal carbohydrate may be given, consisting of not only the usual three meals but also lunches between meals and at bedtime.

In character, the cases ranged from mild to moribund. Exact data can be given only in the detailed reports, but the majority were severe, active and febrile. The City Hospital work was hampered by lack of suitable control periods, the treatment in most cases being begun soon after admission and the results judged only by the general experience of the tuberculosis specialists with such cases. In the Valley View Sanatorium there was the advantage of prolonged and complete preliminary observations for comparison with the subsequent results under insulin. One general conclusion was that in a broad clinical sense insulin properly used is harmless. Reactions are usually easy to prevent and harmless if they occur. Fever is by no means a contraindication, though in far advanced cases the disturbances of insulin injections and increased feeding may elevate the temperature somewhat and thus be undesirable. Hemorrhage also need not be a contraindication, except in a minority of sensitive cases, and some very good results have been obtained in this type. Rarely, urticaria or other symptoms may prove troublesome, even to the extent of stopping the treatment. Intestinal lesions are more often an indication than a contraindication for insulin.

The administration of insulin to nondiabetic patients in such quantities and for such periods is an experiment in itself, and a watch has therefore been kept for possible endocrine effects. Only one patient displayed any tendency to become too fat, requiring artificial regulation of calories. The others were automatically inhibited by the nausea and other symptoms previously mentioned. One question considered was whether the carbohydrate tolerance would change by reason of either stimulation or disuse atrophy of the patient's own pancreatic islands. With numerous dextrose tolerance tests we have confirmed the observation of some former authors that abnormally high results are rather common in tuberculosis. The accompanying table illustrates some of these figures and also the fact that they are apt to become considerably higher during the course of insulin treatment. Later tests showed, however, that this is a temporary peculiarity passing off within a few days after discontinuance of the insulin, and in no instance has there been any evident tendency to the development of diabetes or any other endocrine disorder.

The most striking and obvious clinical result in a case of suitable type is a gain in appetite, weight, strength and spirits. This result is apt to be greatest in the mild or quiescent cases and to be less in proportion as fever and intoxication are greater, but there are exceptions in both directions. A general summary is not very useful because of individual variations. Taking the City Hospital series for illustration, the forty-five patients showed an average gain of 25 pounds (11.3 Kg.), ranging from a minimum of 3 pounds (1.4 Kg.) to a maximum of 29 pounds (13.2 Kg.) in females, and from a minimum of 5 pounds (2.3 Kg.) to a maximum of 54 pounds (24.5 Kg.) in males. In two cases there was weight loss of respectively 2 and 6 pounds (0.9 and 2.7 Kg.) with insulin. Except in the very advanced cases, the weight and strength gained under insulin were entirely or largely retained after the insulin was stopped.

Chart 2 illustrates two of the best results in the Valley View Sanatorium series. The solid line represents the weight of a young woman, aged 26, with far advanced bilateral tuberculosis, severe cough and pro-

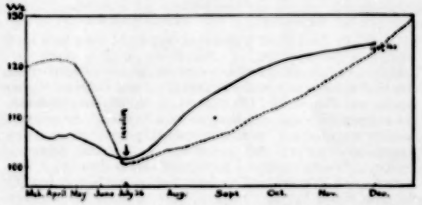

Chart 2.—Best results in Valley View Sanatorium series: solid line, weight of Anna T., aged 26; broken line, weight of Frank C., aged 22.

fuse expectoration, temperatures of from 99.6 to 100.6 F., and a complication with violent attacks of sinusitis with daily purulent discharge. Other symptoms were severe headaches, flatulence, gnawing sensations in the abdomen, nausea and vomiting (diagnosis of hyperacidity and duodenal ulcer), general malaise, weakness, loss of weight, and toxic appearance. During three months in the hospital, downward progress in all these respects was demonstrated. The establishment of artificial pneumothorax on the left side did not bring any clinical improvement. With the beginning of insulin there was an immediate change. The indigestion and abdominal symptoms disappeared almost completely. The attacks of sinusitis subsided, though some purulent discharge persists. The gains in strength, spirits and

general comfort correspond to the gain in weight. The x-ray reports seem more encouraging but must be confirmed by longer time.

The broken line represents the weight of a man, aged 22, who had been under observation for six years and in the hospital one year. He appeared greatly improved following phrenic section, but on transfer to the ambulant ward preparatory to discharge he had a serious breakdown with increase of cough and sputum, temperatures of from 100 to 101 F., lack of appetite and strength, and loss of 20 pounds (9 Kg.), the condition being such that his death was expected soon. Under insulin treatment there was gain of strength and spirits corresponding to the gain in weight, the temperature fell and the sputum diminished. The improvement shown by roentgenograms was also very marked.

These examples are given only to illustrate the best results, and there are all other gradations from partial success to complete failure. I shall not go further into the clinical results, because this paper is intentionally written from the standpoint of metabolism. I shall therefore draw only one conclusion; namely, that in a large proportion of tuberculosis cases ranging from quiescent to severe, the proper use of insulin can produce marked gains of weight, strength and spirits. Any further conclusions must be drawn with the aid of the tuberculosis specialists in the papers in which they collaborate. It is clearly recognized and has been emphasized from the beginning of this work that insulin is not a specific antibody or a cure of tuberculosis and is not expected to save inherently hopeless cases. On the other hand, it may be permissible to state that the tuberculosis specialists engaged in this work have gained the impression of a beneficial effect of insulin as judged by clinical and laboratory results, and this interpretation appears plausible in view of the generally accepted importance of nutrition in tuberculosis.

45 East Sixty-Second Street.

ABSTRACT OF DISCUSSION

DR. F. F. CALLAHAN, Pokegama, Minn.: I have been using insulin in the treatment of tuberculosis for four years. My attention was attracted to this treatment because of good results obtained in cases of combined tuberculosis and diabetes. Before insulin was discovered I felt that practically all cases of moderate severity with this complication were hopeless. After beginning to use insulin I found that diabetic patients handled their tuberculosis just as well as others of the same degree of severity. The dosage that I use is much lower than Dr. Allen's. I start with 3 units half an hour before meals and increase the dose slowly but have never given more than 15 units three times a day. The best results have been obtained in undernourished patients with anorexia and little or no fever. My experience in cases of acute tuberculosis presenting high fever has been disappointing. It is possible that a larger dose in some of these cases would prove helpful. A few patients with normal blood sugar showed traces of sugar in the urine during insulin treatment. I have been unable to account for this reaction. I agree with Dr. Allen that insulin is not a specific in tuberculosis. It has very definite limitations in the treatment of the disease but many cases are greatly benefited by its use. I think also that cases of anorexia and malnutrition due to other chronic diseases should have the benefit of a course of insulin therapy when they do not respond to other treatment. A man, aged 25, admitted with bilateral tuberculosis after twenty months' treatment in another sanatorium, had a pyopneumothorax with typical signs of tuberculosis of the larynx and cecum. He had been failing steadily. His physician suggested thoracoplasty; we compromised by changing from pneumothorax to oleothorax. In a few weeks the pus had disappeared from the left pleural cavity and there was definite improvement in the contralateral lung. He gained weight very slowly until he was started on 5 units of insulin three times a day, the dosage being increased to 8 units. In a year he had gained 40 pounds (18 Kg.) and all symptoms of active tuberculosis had disappeared. He is still doing well.

DR. F. M. POTTENGER, Monrovia, Calif.: There is a certain type of patient who does not make satisfactory improvement under the ordinary regimen. These patients are often poor eaters, even when well, and fail to gain on a regimen that fattens the average patient. This is the type which, in my hands, has gained most from the use of insulin. It has been my experience that patients with tuberculosis show a greater tendency to urticarial reaction to insulin than do the nontuberculous patients and those with diabetes. I should like to know whether this conforms with Dr. Allen's experience. Another interesting experience noted was that of a local degeneration of the muscles following the use of insulin. This did not occur at the point of injection but in distant areas. It was most marked in the gluteal muscles. Two patients were given from 15 to 30 units a day in three doses, twenty minutes before each meal. Both patients gained in weight. One gained from 83 to 120 pounds (37.6 to 54.4 Kg.), and the other from 110 to 122 pounds (50 to 55.3 Kg.). The degeneration in the two patients was so marked that it showed as a distinct furrow in the gluteal muscles. I also noticed in these patients a slight degeneration of the leg and arm muscles. I had difficulty in finding an explanation of the phenomenon. I had been of the impression that tuberculous patients have a low sugar tolerance. I have noticed that those who are acutely ill do not seem to take the normal amount of sugars and starches, if allowed to follow their own inclination. I attempted to increase their sugar intake but found that they had an aversion to it. After a little while, however, on forced sugar intake, the degeneration disappeared. There is no doubt that insulin will aid in putting on weight, and probably at the same time in building up the general resistance of the tuberculous patient who is naturally under weight or who fails to gain under the ordinary regimen. In certain instances it seemed that the insulin was not only of value in putting on weight but that it also improved the pulmonary condition. Whether this was true or not could not be readily proved. It is very difficult to assign the exact part which any measure plays in the treatment of a tuberculous patient, for one does many things, each of which may help in a limited way.

DR. E. S. NICHOL, Miami, Fla.: I suppose, since no follow up was given by Dr. Allen, that most of these cases have been treated somewhat recently. It is unfortunate that more of a picture of the after-phase of these cases cannot be obtained. My experience with insulin in tuberculosis is small compared with Dr. Allen's group, but in the general group of nondiabetic patients, with constitutional leanness, malnutrition or asthenia, it has been fairly extensive. I found that insulin was provocative of good appetite and had a typical reaction. Until two years ago there were some sixty or seventy papers published on the use of insulin in this type of case, but no author reported a follow up to show how long the nutritional gain lasted. I attempted such a follow up two years ago and reported sixty-three cases at the meeting of the Southern Medical Association in New Orleans. Many of the patients were followed from one to five years. Approximately 20 per cent of these patients maintained the weight gained, most of them losing their gain during the first year. So far as tuberculosis is concerned, I have yet to find a carefully controlled experiment in which insulin was given along with other sanatorium treatment and then followed up over a long period.

DR. MOSES BARRON, Minneapolis: I have used insulin treatment of undernourishment now for a number of years in a manner similar to that described by the author. I had the opportunity of seeing the first cases treated by Bauer and Falta in Vienna in 1926 and was impressed then with the good results obtained. I have recently reported a series of thirty cases treated with insulin. I have obtained good results in 75 per cent of the cases. Most of the patients have retained their weight, though some of them did fall back. My series included instances of undernourishment in adults who were nontuberculous. I am much impressed with Dr. Allen's excellent results. These cases demand a careful follow up in order to decide the final results. In my cases I give fairly large doses.

I begin with 5 units three times a day about half an hour before meals and increase by 1 or 2 units three times a day until an average dosage of 25 units three times a day is reached. My largest dose has been 35 units three times a day. I have had no experience with dosage as large as 200 or more units a day. Offhand, these seem like very massive doses; and still they result in no insulin reaction. I have had no serious reactions in my cases. The present discussion is of great interest, since it shows that insulin is effective in undernourishment even in such specific infectious diseases as tuberculosis during the active stage of the disease.

DR. WILLIAM S. COLLENS, Brooklyn: A well known physiologic fact is that the removal of the suprarenals will sensitize the animal to insulin. Cannon has definitely demonstrated that, following a unilateral suprarenalectomy in a cat and the removal of the medulla of the opposite suprarenal, the animal will become so sensitive to insulin that approximately one fortieth of the dose of insulin is necessary to produce the same effect as is produced in the same animal before the suprarenal operations. It becomes necessary, therefore, to speak a word of caution in connection with the use of insulin in tuberculosis even though the clinical results are apparently very striking. In illustration of the point in question, a Negro, aged about 50, with a very active bilateral pulmonary tuberculosis running a febrile course, was given insulin. As little as 5 units produced very violent hypoglycemic reactions, necessitating the cessation of insulin therapy after five doses. The patient died two weeks following this treatment and the postmortem examination disclosed almost complete destruction of the suprarenals.

DR. FREDERICK M. ALLEN, Morristown, N. J.: Insulin was administered in the widest possible variety of cases in order to see its effects, not to recommend it as a routine measure. Gains of weight and appearances of clinical improvement were obtained in some cases of the type which according to most authors are not suited for insulin treatment. The fact remains that insulin is not expected to cure hopeless cases, and the greatest and most lasting results are found in the milder and less toxic types. Dr. Callahan has reminded me that when the insulin prepared from hog pancreas causes urticaria, insulin especially prepared from beef or other species may not do so. Only two treatments have had to be stopped on account of urticaria. In violent attacks, injections of epinephrine hydrochloride may be useful for temporary relief. Evidently there is greater sensitiveness among the tuberculous than among other patients, and urticaria is therefore a more important problem with them. The atrophy of tissues is a rarity and I do not know the reason for it. The observations of Leggett and Callahan are among the longest, while those that I have reported extend over eighteen months. The longest continuous use of insulin in any individual of this group was eight months. Detailed publications will show that the weight gained with insulin is as a rule well retained, except in cases which are too severe or toxic. Individualization of the dosage should be emphasized. The giving of 320 units a day was merely to demonstrate the harmlessness in a favorable case. The dosage usually begins with 5 units and increases to 30 or 40 units three times daily, but experience is desirable for adjusting the insulin to the individual need instead of following any arbitrary rule. As I have tried to make clear from the outset, insulin is not a cure for tuberculosis but only an aid to the treatment. It is not suitable for all cases and will not save hopeless ones. In some quarters there seems to be a doctrine that patients with a certain progressive type of lesion or a certain lack of resistance will die regardless of treatment, while others with a less dangerous form of infection or with adequate resistance will get well. In an extreme application this doctrine would mean discarding all treatment known up to the present. Neither abundant food, nor climate, nor bed rest, nor pneumothorax can cure tuberculosis or save inherently hopeless cases. It is difficult to prove conclusively that vitamin diets affect the mortality. Nevertheless all these measures are in practical use and are universally believed to be beneficial. The tuberculosis specialists in our group believe that insulin deserves a place in this list for use in selected cases, because of its effect in improving nutrition and possibly otherwise altering the soil on which the tuberculous infection develops.

Clinical Notes, Suggestions and New Instruments

ACUTE EDEMA OF THE LARYNX COMPLICATING MEASLES

KENNETH S. OLIVER, M.D., AND EDWARD L. TURNER, M.D.
BEIRUT, SYRIA

Acute edema of the glottis occurring during measles is mentioned as a rare complication by several authors. Barnhill [1] states that acute edema of the larynx sometimes follows or accompanies the worst types of exanthems. Coakley [2] lists measles as one of the causes of edema of the larynx. Morse [3] states that severe inflammation of the larynx is an occasional complication of this disease in children. Scheppegrell [4] states that "acute laryngitis is sometimes simulated by the initial stage of an attack of measles. This may become so severe that a tracheotomy is required to relieve the danger of suffocation. As the edema of the larynx is usually relieved by the development of the rash, the operation should be deferred as long as possible and if necessary intubation given the preference."

REPORT OF CASES

Last winter we saw three cases of acute edema of the larynx as a serious complication during an epidemic of measles in Beirut, Syria. Because of the fact that this complication is relatively rare and, when present, usually appears before the eruption, we feel that the cases are worthy of presentation:

CASE 1.—T. H., a boy, aged 7 years, admitted to the hospital, Jan. 22, 1933, complained of difficult respiration and cyanosis during the past two hours. About ten days before, the patient had a mild chill followed by cough, headache and photophobia. On the fourth day of his illness a typical measles rash appeared. He was seen for the first time by one of us (E. L. T.) after the rash had appeared. Treatment was outlined and the condition progressed satisfactorily for the next six days. January 22, while playing with his toys in bed, he suddenly began to cough and have difficulty in breathing. The parents paid no attention to it at first but within thirty minutes the child had become cyanotic, was coughing violently and breathing with a very loud stridor. A physician was called (E. L. T.) and the diagnosis of acute edema of the larynx made. The child was wrapped in blankets and brought to the hospital about three blocks away, where a tracheotomy was performed immediately. As soon as the tracheal tube was in position he began to breathe easily and his temperature, which was 38.5 C. (101.3 F.) on admission, dropped to 37 C. (98.6 F.) within twenty-four hours. The remainder of his illness was uneventful. The tracheal tube was removed, January 27, and the child was discharged in good condition, January 28.

CASE 2.—M. H. B., a boy, aged 4 years, admitted to the hospital, Feb. 16, 1933, complained of increasing difficulty in respiration during the past three days. The child had been ill for thirteen days previously. Three days after the onset a typical measles rash developed. The rash had begun to disappear, when the parents noticed that the child was having increasing difficulty with respiration. His voice became hoarse, the respiratory difficulty increased, a stridor was audible and the child was cyanotic. He was brought to the hospital by his family physician and a tracheotomy was performed because of the laryngeal edema. The temperature on admission was 41 C. (105.8 F.). Twenty-four hours after the tracheotomy the temperature had fallen to 38 C. (100.4 F.). The child's condition became complicated by a severe cervical adenitis and on February 27 the temperature reached 39.7 C. (103.4 F.). February 28, pus was aspirated from a fluctuating swelling on the left side of the neck. The abscess was incised, March 1, and the pus evacuated. The pus contained gram-negative fusiform

From the Departments of Otolaryngology and Internal Medicine, American University of Beirut.

1. Barnhill, J. F.: The Nose, Throat and Ear, New York, D. Appleton & Co., 1928.
2. Coakley, C. G.: Manual of Diseases of the Nose and Throat, Philadelphia, Lea & Febiger, 1922.
3. Morse, J. L.: Clinical Pediatrics, Philadelphia, W. B. Saunders Company, 1926.
4. Scheppegrell, William, in Abt's Pediatrics, Philadelphia, W. B. Saunders Company, 1925, volume 3.

bacilli, abundant small gram-negative coccobacilli and diphtheroids. Following this incision the condition of the child rapidly improved. The tracheotomy tube was stopped completely, March 9, and the child was discharged in good condition, March 17.

CASE 3.—E. T., a girl, aged 3 years, admitted to the hospital, Feb. 23, 1933, had been ill with a typical attack of measles several days prior to admission. She was brought to the hospital with marked respiratory stridor from acute edema of the larynx. The child was markedly cyanotic and the temperature was 41 C. (105.8 F.). The entire neck and chest were edematous and the measles rash was still visible. Immediate tracheotomy was performed but the child's general condition was so bad that she died eight hours later.

SUMMARY

Three cases of acute edema of the larynx complicating measles occurred during an epidemic of measles in Beirut during the winter of 1932-1933. Two of the patients recovered following tracheotomy, while the third one died. All three cases developed several days after the rash had appeared and not during the earlier prerash stage as is reported in most of the literature.

Council on Pharmacy and Chemistry

REPORTS OF THE COUNCIL

Statement of the Council on Pharmacy and Chemistry on Hospital Formulary

INQUIRIES CONCERNING HOSPITAL FORMULARIES AND THE PROBLEM OF PRESCRIBING IN HOSPITALS ARE RECEIVED BY THE SECRETARY FROM TIME TO TIME. A SYMPOSIUM ON HOSPITAL PRESCRIBING WAS HELD IN 1930 (THE JOURNAL, APRIL 26, 1930, PP. 1277-1284). RECENTLY A COMMITTEE ISSUED A FORMULARY FOR THE NEW YORK HOSPITAL, AND AN ARTICLE BY ROBERT A. HATCHER AND WENDELL J. STAINSBY, WHICH DISCUSSES SOME OF THE MAJOR PROBLEMS OF THE HOSPITAL FORMULARY, WAS PRESENTED AT THE RECENT MEETING OF THE AMERICAN PHARMACEUTICAL ASSOCIATION. THE PLAN OUTLINED IN IT IS IN HARMONY WITH THE IDEALS OF THE COUNCIL, WHICH HAS THEREFORE AUTHORIZED PRESENTATION OF THIS PAPER AS A DISCUSSION OF ONE PLAN FOR DETERMINING THE TYPE OF PREPARATIONS ESSENTIAL IN HOSPITAL PRACTICE. THE ENDORSEMENT OF THIS ARTICLE BY THE COUNCIL, HOWEVER, IS NOT TO BE CONSTRUED AS HOLDING THAT THIS IS AN OFFICIAL PLAN, OR ONE THAT MAY NOT BE MODIFIED TO MEET OTHER SITUATIONS.

PAUL NICHOLAS LEECH, Secretary.

THE HOSPITAL FORMULARY

By ROBERT A. HATCHER and WENDELL J. STAINSBY, New York

Large hospitals find it necessary to limit the prescriptions of the staff mainly to selected formulas, and this system has tended to promote the use of proprietary formulas, which usually cost much more than their official equivalents without corresponding advantage. The physicians of the staff do not often come in contact with the purchasing department or with the pharmacy of the hospital, but they are frequently interviewed by the representatives of pharmaceutical manufacturers, who persuade them that their preparations have marked advantages over the pharmacopeial.

The formulary of the New York Hospital was prepared by a committee, which invited representatives of every department to present formulas desired for their departments. In every case where a complex formula or a proprietary preparation was desired the advocate of it was requested to present evidence of its superiority over the equivalent official preparation, and unless such evidence was submitted the committee declined to admit the article, or, in a few cases, admitted it with the proviso that it would be deleted unless evidence was presented that would justify its retention in a subsequent edition of the formulary.

The committee adopted the following rules governing the admission of articles to the formulary:

Rule I. Simple official (Pharmacopeial) substances will be admitted (when requested) unless they have become superfluous.

Rule II. No article will be admitted (except for controlled research) before its therapeutic value has been established.

From New York Hospital-Cornell University Medical College.

Rule III. No article of secret composition will be admitted.

Rule IV. No article which is sold under a proprietary name will be admitted under such a name if a substance of identical composition can be obtained under a nonproprietary name.

Rule V. No mixture of two or more active substances will be admitted unless evidence is submitted that the mixture presents therapeutic advantages over the simple substances.

Rule VI. No proprietary article will be accepted before it has been accepted by the Council on Pharmacy and Chemistry of the American Medical Association for inclusion in New and Nonofficial Remedies.

Rule VII. Requests for articles not included in the formulary of the hospital, but which are desired for use in controlled research which has been approved by the head of the department in which the investigation is to be conducted, will receive consideration by the committee.

Rule VIII. It is the policy of the committee to discourage the intravenous and intramuscular injection of substances which should be administered orally.

A careful examination of these rules will convince one that no article which is essential to the treatment of the sick is excluded from the formulary. For example, insulin was admitted without question, because there is no pharmacopeial substitute. On the other hand, mere popularity was not accepted as evidence of value.

In a few cases, members of the staff were so firmly convinced of the superiority of a proprietary preparation that a blind test was proposed. In one such case, each of several departments was supplied with capsules containing the official barbital, and the therapeutic equivalent of a proprietary barbital derivative. These were labeled either A or B for the smaller dosage, and C or D for the larger, with the statement that the capsules contained either barbital or the derivative in question. This investigation has not yet been completed, but it is intended to analyze carefully the results of the reports of the several departments of the hospital, in order to determine whether the evidence supports the contention of the advocate of the proprietary article. If the evidence does show that it is superior to barbital, it will be admitted to the formulary. It is intended to pursue a similar policy in every case, so far as it is possible, so that no member of the staff can have any reason to feel that he is deprived of any drug which he considers essential; but he must furnish satisfactory evidence, in the form of reports of his own investigations or from the literature.

One member of the staff was so insistent on the superiority of a proprietary preparation of theobromine over the official preparations that one of us has conducted a pharmacologic study of the problem involving probably about 200 experiments. While the results of these experiments are not conclusive, they do not afford any evidence that the proprietary preparation has any advantage over the official Theobromine Sodio-Salicylate. However, they do tend to throw light on the value of these preparations for the relief of cardiac pain in certain conditions.

As indicated in the rules, this does not interfere with the therapeutic study of any proprietary preparation, nor does it prevent the use by any department in the hospital of any substance concerning the superiority of which the staff is so firmly convinced that it is willing to conduct a scientific study of its uses, or to provide it at departmental expense. Since the publications of the formulary, the committee has continued to pass on the acceptability of various formulas and articles requested by the staff.

The committee could not have carried out its plans without the whole-hearted cooperation of the staff, and, with very few exceptions, the rulings of the committee have been accepted without protest after the whole subject had been discussed in considerable detail.

The use of the formulary has resulted in marked economy, but it is too early to determine the precise amount saved to the hospital. However, we are mainly interested in a system of rational therapeutics, and we believe that the use of official preparations is far more conducive to rational therapeutics than is the use of secret or semisecret preparations, or of a great variety of preparations having nearly similar effects and differing only in dosage.

This plan requires for its fullest success a highly skilled pharmaceutical staff capable of cooperating with the medical staff of the hospital in the conduct of therapeutic research. The training of men to fill the pharmaceutical positions in such progressive hospitals constitutes at once an opportunity, and a challenge to the schools of pharmacy, for there are few such pharmacists now available.

Committee on Foods

ACCEPTED FOODS

THE FOLLOWING PRODUCTS HAVE BEEN ACCEPTED BY THE COMMITTEE ON FOODS OF THE AMERICAN MEDICAL ASSOCIATION FOLLOWING ANY NECESSARY CORRECTIONS OF THE LABELS AND ADVERTISING TO CONFORM TO THE RULES AND REGULATIONS. THESE PRODUCTS ARE APPROVED FOR ADVERTISING IN THE PUBLICATIONS OF THE AMERICAN MEDICAL ASSOCIATION, AND FOR GENERAL PROMULGATION TO THE PUBLIC. THEY WILL BE INCLUDED IN THE BOOK OF ACCEPTED FOODS TO BE PUBLISHED BY THE AMERICAN MEDICAL ASSOCIATION.

RAYMOND HERTWIG, Secretary.

VETAB

Manufacturer.—Vitab Products Company, San Francisco.

Description.—Ground wheat germ and rice polishings.

Manufacture.—The ingredients are admixed in definite proportions and treated by heat in a rotating drum for destruction of insect infestation. The processed material is bolted on a silk screen separator; that which passes through is packed in cartons as Vetab. The maximum temperature to which the product is raised is 70 C.

Analysis (submitted by manufacturer).—

	per cent
Moisture	9.9
Ash	7.5
Fat (ether extraction method)	13.2
Protein (N × 6.25)	12.1
Reducing sugars as maltose	4.5
Starch (acid hydrolysis method)	38.3
Crude fiber	0.7
Carbohydrates other than crude fiber (by difference)	56.6

Calcium oxide (CaO)	0.36	Ca.	0.26
Chlorine		Cl.	0.01
Iron oxide (Fe_2O_3)	0.019	Fe.	0.013
Magnesium oxide (MgO)	1.28	Mg.	0.77
Phosphoric anhydride (P_2O_5)	3.86	P.	0.84
Potassium oxide (K_2O)	1.67	K.	1.39
Sodium oxide (Na_2O)	0.09	Na.	0.06
Sulphur		S.	0.21

Calories.—3.9 per gram; 97 per ounce.

Vitamins.—Vitamin B assay: rat tests with Chase and Sherman method, 7.3 units per gram, 210 per ounce. (Wheat germ and whole wheat approximate respectively 283 and 43 units per ounce.)

Claims of Manufacturer.—A rich source of vitamin B. Rich in the mineral elements calcium, magnesium, phosphorus, potassium and iron.

HORMEL FLAVOR SEALED VEGETABLE SOUP

Manufacturer.—George A. Hormel & Co., Austin, Minn.

Description.—Vegetable soup containing beef broth, tomatoes, potatoes, carrots, celery, navy beans, corn, rice, barley, string beans, lentils, peas, pimientos, okra, kidney beans, salt, and onion extract.

Manufacture.—Dried navy beans, lentils, rice, barley and kidney beans are carefully inspected; foreign substances and imperfect grains are removed by special devices and by hand. The navy beans are ground before using; the other dry ingredients are used whole.

Fresh potatoes, carrots, celery and onions are cleaned by mechanical agitation in free running water and hand trimmed and cleaned with knives and water. They are inspected at least five times and are not exposed to the air for more than one hour after work of preparation has begun. Onions are peeled, chopped, and placed in cheese-cloth bags to be cooked in the broth. Carrots are mechanically peeled, freed from black spots and green tops by hand, mechanically diced, and again hand inspected. Potatoes are peeled by an electrical rotary water spraying machine, the eyes are removed, and the potatoes are diced and placed in cold water until used. Celery is devoided of root and leafy attachments, which are disposed of immediately. The stalks are dismembered, inspected, sorted, and placed in a rotary agitator, where they are freely sprayed with water; the water is drained off simultaneously with the spraying so as to assure removal of any insect spray residue. The celery is again cleaned by hand by skilled operators and inspected.

Purchased canned tomatoes, okra, string beans, peas, corn and pimientos are used. The tomatoes are heated in a steam jacketed kettle to over 77 C. before using; discolored pieces are removed from the green okra; the string beans and peas are drained. If possible, vacuum packed corn is used; if not, drained regular canned corn is used. The juice of the pimientos is drained off, seeds and black specks of roasted skins are removed, and the pimientos are diced.

The beef broth is prepared from trimmings from U. S. Department of Agriculture inspected and passed beef. The fat is removed and ground separately. The ground meat in cheese-cloth bags and definite quantities of onions and ground fat are cooked in water containing tomato purée and salt. The bags are removed, the fat is skimmed off and the broth is strained through cheese-cloth.

Cans, on conveyor belts, are filled automatically with definite quantities of the respective vegetables; the beef broth is automatically added to fill the cans, which are sealed, cooked in retorts for ninety minutes at 100 C. and twenty minutes at 115 C., and chilled.

Analysis (submitted by manufacturer).—

	per cent
Moisture	92.
Ash	1.2
Fat (ether extract)	1.4
Protein (N × 6.25)	1.3
Crude fiber	0.3
Carbohydrates other than crude fiber (by difference)	3.8

Calories.—0.3 per gram; 9 per ounce.

Claims of Manufacturer.—Nearly a pint of beef soup stock and fifteen vegetables in every can. Cooked in the can.

McCORMICK'S BEE BRAND IMPORTED PAPRIKA

Manufacturer.—McCormick and Company, Inc., Baltimore.

Description.—Ground dried paprika (pimenton, pimiento) (ripe fruit of Capsicum annuum L.).

Manufacture.—Spanish paprika is dried in the sun and ground after removal of the stems, seeds and placentas, producing a mild paprika. The powder is exported and packed in tins at the packing plant.

Analysis (submitted by manufacturer).—

	per cent
Moisture	4.7
Total ash	7.1
Acid insoluble ash	0.5
Volatile ether extract	0.9
Nonvolatile ether extract	10.6
Protein (N × 6.25)	15.4
Crude fiber	17.4
Carbohydrates other than crude fiber (by difference)	43.9
Iodine number of extracted oil	133

Claims of Manufacturer.—Conforms to the United States Department of Agriculture standard.

SENTRY WHOLE WHEAT FLOUR

Manufacturer.—Breese Grain Company, Breese, Ill.

Description.—Whole wheat flour milled from red winter wheat.

Manufacture.—Whole wheat is cleaned, scoured and reduced to a flour.

Analysis (submitted by manufacturer).—

	per cent
Moisture	12.6
Ash	1.6
Fat (ether extraction method)	1.6
Protein (N × 5.7)	10.5
Crude fiber	2.0
Carbohydrates other than crude fiber (by difference)	71.7

Calories.—3.4 per gram; 97 per ounce.

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SATURDAY, DECEMBER 2, 1933

ECONOMIC TRENDS AND THE WEIGHT OF CHILDREN

The continuance of the economic depression has given rise to many predictions as to its dire consequences to human health. Without doubt a prolonged period of unemployment and hardships incident to failing incomes is likely to affect seriously the standard of living in any country in which such situations arise. Economic collapse may naturally be expected to affect the food distribution of the population almost as readily as the failure of crops or the blockades of warring nations. The menace usually seems most threatening to the child population, for this represents groups of persons who, on the one hand, are least able to make adjustments on the spur of the occasion and, on the other, have peculiar needs represented by the demands of growth.

Malnutrition among children, always an interesting problem, has been emphasized recently through the publicity associated with the Child Health Recovery Conference called at Washington early in October by the Secretary of Labor. This conference was said to be called for the purpose of considering an emergency in child health due to the depression. Specifically, it was alleged that from six to seven million children in the United States are suffering from malnutrition due more or less directly to the economic crisis through which the country has been struggling for the past four years. The meeting disclosed certain fundamental differences of opinion. During the discussion of the recommendations of the executive committee of the conference, which called for an extensive program of physical examinations on a nationwide scale for the discovery of malnutrition, it became evident that many of those in attendance, including physicians with long experience in public health work, were by no means convinced that any increase in malnutrition had been demonstrated.[1] The statistics presented in support of the claim that millions of children are underweight as a result of the depression were challenged. The opinion was advanced that a preventive program consisting merely of providing funds for supplying bread and milk in adequate amounts was all that would be necessary to guard against the possible development of undernourishment among children.[1]

In the light of this conflict of opinions, special interest attaches to the study by Palmer[2] of growth in children in relation to the economic depression. This study was carried out in Hagerstown, Md., chosen because approximately twenty million of our people live in communities of similar character. In the composition of its population, employment, charitable agencies and other community characteristics, including financial, it is reasonably representative of others of like size. Palmer[3] had already made studies of variability of weight among elementary school children in Hagerstown from 1921 to 1927. These studies were available to serve as a control for the current observations. Palmer concluded that the average weight of children in the two periods presents no consistent or statistically significant differences and that the variability of body weight, measured by the standard deviation, is not consistently different for the two periods as far as boys are concerned, but that the weight for girls is slightly more variable in 1933 than from 1921 to 1927. He found four fewer boys and forty-one more girls who were 12 per cent or more underweight in 1933 than would have been expected if the same proportions had been found underweight as in the earlier study. A further classification disclosed that among families of the unemployed, those of the partially employed and those of the regularly employed, the same differences existed as are commonly found between children of different socio-economic classes. Palmer concluded that there has been no obliteration or widening of the class differences during the period of the depression. A still further classification into groups receiving aid from charity and those not receiving aid shows that children in the former class are from 2½ to 9 pounds lighter than in the latter, and Palmer infers that children who are most in need of supplementary aid are probably receiving it.

It is acknowledged that weight alone is not a satisfactory criterion of nutrition, except in a general way, but may be used to a limited extent as a convenient general index. Comparative studies such as those of Palmer are more significant than the statistics derived from the routine weighing of thousands of children, often without supervision, by nurses and teachers. The situation in Hagerstown, as described by Palmer, is probably fairly representative. It does not justify hysteria about the increase of malnutrition as a result of the depression. That thousands of children are underweight may be conceded; unfortunately, that has always been so. That well considered measures ought

1. Proceedings of Child Health Recovery Conference, Washington, D. C., Oct. 6, 1933, Children's Bureau, U. S. Department of Labor.

2. Palmer, C. E.: Growth and the Economic Depression, Pub. Health Rep. 48:1277 (Oct. 20) 1933.

3. Palmer, C. E.: Variations of Growth in Weight of Elementary School Children, 1921-1928, Pub. Health Rep. 48:993 (Aug. 18) 1933.

to be taken for the correction of such a condition may also be conceded, as may the possibility pointed out by THE JOURNAL[4] that the results of the economic catastrophes of the past four years may not be manifest at once. At the same time, care should be taken that measures advocated are sound and may reasonably be expected to accomplish the end sought.

The program advanced by the executive committee of the Child Health Recovery Conference leaves much to be desired, especially with respect to the proposal to examine, in what must be a hurried and superficial manner, millions of children. Fortunately the program was adopted as a recommendation only, and the state medical societies are to have a voice in its further development in the respective states. Emphasis on adequate food relief seems most sensible and immediately effective, utilizing the knowledge of health and nutritional conditions in the various communities, already possessed by physicians, by public health and relief officials and by social service organizations.

THE INTERNAL TEMPERATURE OF THE BODY

In the classic volume "Experiments and Observations on the Gastric Juice and the Physiology of Digestion," published by William Beaumont, America's pioneer physiologist, just a century ago, he records a series of observations made under various conditions on the temperature of the interior of the stomach of Alexis St. Martin. The records were secured by insertion of either a "mercurial" or a "spirit" thermometer through the gastric fistula. In the chapter of inferences that form the conclusion of Beaumont's book he stated "that the natural temperature of the stomach is 100 Fahrenheit, that the temperature is not elevated by the ingestion of food, that exercise elevates the temperature, and that sleep or rest, in a recumbent position, depresses it." Incidentally he pointed out that, when the distance of the inserted bulb from the pylorus varied, some variation in temperature could be observed amounting to "three fourths of a degree, between the splenic and pyloric extremities." The accuracy of these records, like much of what Beaumont reported, receives a surprising confirmation in the data secured with thermometric apparatus of special construction a hundred years later. Hepburn, Eberhard, Ricketts and Rieger[1] of Philadelphia have found that in 129 men the maximum gastric temperature was 101.8, the minimum 97.8 and the average 99.2. In 128 women the maximum was 102.2, the minimum 97.5 and the average 99.4. With each sex the gastric temperature was between 99 and 99.9 in approximately six tenths of the subjects, and between 98 and 100.9 in more than nine tenths of the persons examined.

The internal temperature of the body and its variations are not without considerable interest. Accurate determinations, in all but exceptional instances such as gastro-intestinal fistulas afford, have been few until modern times. In the Philadelphia observations, in a group of fifty-three persons the temperature of the upper part of the intestine lay between 98 and 100.1 F. (average 99), and was within one degree of the gastric temperature. In a group of six persons the sigmoidal temperature lay between 100.8 and 101.5 F. (average 101.2) and was higher than the oral temperature by two degrees or more.

Application of heat over the gastric and particularly the abdominal areas is often used to give relief when localized distress occurs there. It may be surprising to learn, therefore, that when physical therapeutic agents, such as the electric pad, hot water bag, infra-red lamp, diathermy, hot wet pack or ice bag, were applied locally none of the observed changes in visceral temperature exceeded the maximum variation in gastric temperature during similar periods of time in a control series. Hence the conclusion that the production of any reparative benefit by local application of heat or cold is conjectural. On the other hand, ingestion of either ice water (250 cc.) or ice cream (90 Gm.) produced a marked decrease in gastric temperature, followed by a rise, at first quite rapid, then progressively slower. The average recovery time was in excess of half an hour. Use of ice water in a test meal delayed the gastric emptying time by from fifteen to thirty minutes. Ingestion of hot drinks produced a marked increase in gastric temperature, followed by a decrease, at first rapid, then progressively slower. Hepburn and his co-workers obtained evidence that leakage of a cold beverage through the pylorus lowers the temperature of the upper part of the intestine by several degrees. This observation, they conclude, may throw light on the etiology of gastro-enteric disturbances in patients who have a rapid gastric emptying time and partake copiously of cold beverages.

Current Comment

THE ADMINISTRATION OF THYROXINE

There can no longer be doubt that thyroxine represents the effective iodine-containing hormone of the thyroid gland. As it has been prepared synthetically and the synthesized product has been subjected to conclusive therapeutic tests, all debate about contaminating potent principles and other doubts as to the specificity of thyroxine itself can now be dispelled. A few milligrams of the substance introduced into the blood stream is sufficient to bring about a noteworthy augmentation of metabolism, which may continue for some time. These facts, of course, do not mean that thyroxine as such is identical with the product actually secreted by the thyroid; but it does represent the functionally potent molecular group of the thyroid hormone. In

4. Depression Death Rates, editorial, J. A. M. A. **99**: 1354 (Oct. 15) 1932.

1. Hepburn, J. S.; Eberhard, H. M.; Ricketts, Rowland, and Rieger, C. L. W.: Temperature of the Gastro-Intestinal Tract: The Effect Thereon of Hot and Cold Foods and of Physical Therapeutic Agents, Arch. Int. Med. **52**: 603 (Oct.) 1933.

this respect it is in striking contrast to diiodotyrosine, an inert iodine-bearing amino acid that also has been isolated from the thyroid gland. One of the puzzling features of thyroxine from almost the outset of its discovery and isolation has been the repeated observation of the inefficacy or greatly lowered effectiveness of thyroxine when it is administered by mouth rather than intravenously. At first thought one would expect the purified hormone to be quite as potent as an equivalent amount of desiccated thyroid gland. Frankly there is a marked discrepancy in this respect. Observations at Rush Medical College in Chicago [1] afford at least a partial explanation in the relative insolubility of the pure hormone. Pure synthetic thyroxine had much less effect by mouth than its monosodium salt. According to Harington and Salter,[2] the physical properties of thyroxine are such as to make it highly probable that the absorption of this substance after oral administration would be inefficient and erratic; the digestion product, on the other hand, possessing as it does a much wider range of solubility, might well be absorbed almost quantitatively. The Chicago clinicians point out that, in the digestion of desiccated thyroid, peptides and polypeptides of thyroxine are formed which have a wide range of solubility. They conclude that solubility of the thyroxine compound administered would therefore appear to be important and destruction by intestinal enzymes must be considered; but only future work will determine whether or not some other factor, as yet unknown, is also to be considered.

1. Thompson, W. O.; Thompson, P. K., and Dickie, L. F. N.: Monosodium Thyroxine, Desiccated Thyroid and an Impure Sodium Salt of Thyroxine, Arch. Int. Med. 52: 576 (Oct.) 1933.
2. Harington, C. R., and Salter, W. T.: The Isolation of l-Thyroxine from the Thyroid Gland by the Action of Proteolytic Enzymes, Biochem. J. 24: 456, 1930.

AMEBIC DYSENTERY

The attention of readers is called to a number of letters on amebic dysentery appearing in the correspondence columns of this issue of THE JOURNAL. There is widespread interest throughout the United States in the attempts to control the further spread of this disorder. Moreover, experience is bringing to light exceedingly important information relative to the proper treatment of the disease. Evidence is now available that cases are continuing to appear not only from the original focus of the disease but from secondary foci throughout the United States. As is pointed out by the investigators from the Johns Hopkins Hospital, the disease tends promptly to become a familial disorder once a single case appears in any family. Moreover, the long incubation period (from nine to ninety-five days) means that cases may continue to appear in the future not having been detected in earlier examinations. Thus, one case is reported in an individual who visited the hotel that was the original focus of the disease during the first week in October, after all sanitary precautions had been established, and the health department of the city of Chicago now reports that 10 per cent of the food handlers examined during November were found infested even after examinations of these food handlers had been negative in three previous studies. Experts in the investigation of amebic dysentery writing from California reiterate the warnings that have been emanating from California and from the southern parts of the United States for the past ten years that sooner or later the spread of this disease will become a national problem.

FATTY INFILTRATION OF THE MYOCARDIUM

Sudden death associated with failure of the heart occurs now and then under conditions in which the easily identified causes seem to be lacking. When the characteristic anatomic changes responsible for interruption of cardiac function cannot be demonstrated, death may be ascribed to conjectured spasm of the coronary arteries, ventricular fibrillation, shock, or other functional disturbance. It has been recently stated [1] that, while undoubtedly fatal conditions are encountered for which a satisfactory explanation cannot be obtained by the use of present morphologic methods, it must be emphasized that such assumptions should be made only after careful study has ruled out the possibility of a morphologic explanation. An attempt to discover heretofore unrecognized or unaccepted fatal morphologic changes in the heart has been made, apparently with some success, by Saphir and Corrigan [1] at the Michael Reese Hospital in Chicago. They point out that fatty infiltration of the myocardium was a more conspicuous clinical and pathologic diagnosis a few decades ago than it is today. Modern clinicians mention this condition among cardiac disturbances but are cautious in their interpretation of its significance. Perhaps, they add, the fact that the clinical manifestations are so indefinite has relegated this disease entity to an obscure place in considerations of cardiopathy. According to the Chicago pathologists, however, there are occasional instances in which, in the complete absence of all other major lesions, fatty infiltration is the presumptive sole cause of death. The myocardium of the right ventricle is the region mainly affected. The infiltration leads to a replacement of the muscle fibers by fatty tissue. The muscle fibers primarily become atrophic and later apparently disappear. If the replacement by fat involves a large portion of the myocardium it may lead to sudden death, without any premonitory symptoms of heart failure. Saphir and Corrigan assume that, when such infiltration is present, factors which cause an increased demand on the heart and which under normal conditions could easily be compensated for may lead to sudden death. Fatty infiltration of the myocardium may be regarded as a morphologically demonstrable cause of heart failure and death in instances in which death clinically was thought to have been the result of functional disorders without a morphologic basis. Apparently, a myocardium that is the seat of fatty infiltration may carry on its function as well as a normal heart but has no reserve power. Perhaps, as Saphir and Corrigan further conclude, the use of modern methods of recording auscultatory phenomena may reveal some typical changes; likewise, if numerous electrocardiograms are

1. Saphir, Otto, and Corrigan, Marion C.: Fatty Infiltration of the Myocardium, Arch. Int. Med. 52: 410 (Sept.) 1933.

recorded it may be possible to link to fatty infiltration a low voltage or other unexplained electrocardiographic observations in patients giving no evidence of coronary sclerosis and myocardial fibrosis. They believe that a study employing all the modern diagnostic methods may reveal a definite symptom complex and establish a clinical picture that has as its pathologic basis fatty infiltration of the myocardium.

Association News

ANNUAL CONGRESS ON MEDICAL EDUCATION AND MEDICAL LICENSURE

Tentative Program

The Annual Congress of the Council on Medical Education and Hospitals of the American Medical Association will be held in the Palmer House, Chicago, Feb. 12 and 13, 1934. The Federation of State Medical Boards of the United States and the American Conference on Hospital Service will participate in the congress. The preliminary program follows:

MONDAY, FEBRUARY 12, 10 A. M.

Review of the Accomplishments of the Council on Medical Education and Hospitals
Ray Lyman Wilbur, M.D., Chairman, Stanford University, Calif.

Philosophy of Professional Licensure
Justin Miller, J.D., Dean, Duke University School of Law, Durham, N. C.

Medical Education and Its Relationship to Society as a Whole
Robert G. Sproul, LL.D., President, University of California, Berkeley.

The Restoration of the General Practitioner
Dean Lewis, M.D., President, American Medical Association, Baltimore.

MONDAY, FEBRUARY 12, 2 P. M.

JOINT SESSION OF THE COUNCIL ON MEDICAL EDUCATION AND HOSPITALS AND THE AMERICAN CONFERENCE ON HOSPITAL SERVICE

Responsibility of the Hospital Trustee and the Relationship Between the Trustees and the Staff
Howard S. Cullman, A.B., President, Beekman Street Hospital, New York.

Symposium: Size and Scope of a University Clinic
Henry Houghton, M.D., Director, University of Chicago Clinics.
Nathan B. Van Etten, M.D., Vice Speaker, House of Delegates, American Medical Association, New York.
John H. J. Upham, M.D., Dean, Ohio State University College of Medicine, Columbus.

TUESDAY, FEBRUARY 13, 9 A. M.

JOINT SESSION OF THE COUNCIL ON MEDICAL EDUCATION AND HOSPITALS AND THE FEDERATION OF STATE MEDICAL BOARDS OF THE UNITED STATES

The Privilege of Reexamination in Professional Licensure
Bernard C. Gavit, J.D., Professor, Indiana University School of Law, Bloomington.

A Study of the Administration of Medical Practice Acts
J. N. Baker, M.D., Secretary, Alabama Board of Medical Examiners, Montgomery.

Reciprocity Agreements
John R. Neal, M.D., Secretary, Professional Committee for Medicine, Illinois Department of Registration and Education, Springfield.

Medical Licensure in South America
William D. Cutter, M.D., Secretary, Council on Medical Education and Hospitals, American Medical Association, Chicago.

TUESDAY, FEBRUARY 13, 2 P. M.

The Incorporation of the Principles of Preventive Medicine in Clinical Teaching
Wilson G. Smillie, M.D., Professor of Public Health Administration, Harvard University, Boston.

The Teaching of Industrial Hygiene
Leverett D. Bristol, M.D., Health Director, American Telephone and Telegraph Company, New York.

The Function of the Physician in Public Health Education
W. W. Bauer, M.D., Director, Bureau of Health and Public Instruction, American Medical Association, Chicago.

TUESDAY, FEBRUARY 13, 2 P. M.

THE FEDERATION OF STATE MEDICAL BOARDS OF THE UNITED STATES

Trafficking of Narcotics by Licensed Physicians
H. J. Anslinger, United States Commissioner of Narcotics, Washington, D. C.

The Use of the Injunction Procedure in Enforcing Medical Practice Acts
F. M. Brist, J.D., Attorney, Minnesota Board of Medical Examiners, St. Paul.

Business Session

The Annual Dinner of The Federation of State Medical Boards of the United States will be held at the Palmer House, Chicago, on Monday, February 12.

MEDICAL BROADCAST FOR THE WEEK

Talks over Network of the National Broadcasting Company

The American Medical Association broadcasts each Monday morning from 1:30 to 1:45, Eastern standard time (12:30, central standard time). The subject for Monday, December 4, is "Diet and Health." The speaker will be Dr. Morris Fishbein, editor of THE JOURNAL. Subjects and speakers for subsequent broadcasts will be announced weekly in THE JOURNAL.

Radio Talks from Station WBBM

The American Medical Association broadcasts on Tuesday and Thursday mornings from 8:55 to 9 o'clock, central standard time, over Station WBBM (770 kilocycles, or 389.4 meters).

The subjects for the week are as follows:

December 5. The Food Law and Advertising.
December 7. Fresh Air in the Home.

There is also a fifteen minute talk sponsored by the Association on Saturday morning from 9:45 to 10 o'clock over Station WBBM.

The subject for the week is as follows:

December 9. Communicable Diseases Among Children.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST; SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

ARKANSAS

Clinical Meeting.—The Fort Smith Clinical Society conducted its ninth meeting in Fort Smith, November 7. Clinics were directed by Drs. Ira F. Jones and James H. Buckley; a symposium on goiter was presented by Drs. James W. Amis, Arthur F. Hoge and Frederick H. Krock, and a clinical pathologic symposium on cancer of the uterus, with Dr. Edward H. Skinner, Kansas City, Mo., speaking on "Radium and Radium Therapy." Other speakers included Drs. Herbert Moulton on "Visual Fields in Brain Lesion"; Davis W. Goldstein, "Control of Leprosy in the United States"; James A. Foltz, "Management of Fractures of the Long Bones"; Miles E. Foster, "Essential Points in Skin Grafting," and Charles S. Holt, "The Acute Abdomen." Drs. Harold P. Kuhn and Ferdinand C. Helwig, Kansas City, Mo., exhibited specimens.

CALIFORNIA

University Drops School of Optometry.—The School of Optometry of the University of Southern California, Los Angeles, went out of existence when the fall semester opened, according to the *Optical Journal and Review of Optometry*. There were several reasons for the university's dropping the school; the principal one, according to the report, was the lack of cooperation by the optometrists of southern California.

Symposium on Heart Disease.—Conferences, clinics, discussions and demonstrations constituted the fourth annual graduate symposium on heart disease in San Francisco, November 22-23, under the auspices of the heart committee of the San Francisco County Medical Society, the San Francisco Tuberculosis Association and the health council of the San Francisco Community Chest. The program also included a symposium on arterial hypertension.

Pretzell Pleads Guilty.—Paul Pretzell pleaded guilty in Los Angeles, August 2, to a charge of violation of the medical practice act and was sentenced to 180 days in the city jail. Pretzell claimed to be a doctor of medicine with a New York license, *California and Western Medicine* reported. He was committed to jail in 1930 in Santa Ana County for a similar offense and served a term in the county jail at San Diego for vagrancy, it is reported. Claiming to be a registered pharmacist in New York, Pretzell also claimed that he attended medical school in Heidelberg, Germany, and at Columbia University, New York. He admits, however, that he never graduated and that he had never been licensed to practice medicine anywhere.

Imported Rags.—An order was issued by Dr. Jacob C. Geiger, director of public health of San Francisco, October 19, which calls for the more stringent enforcement of a local law, adopted in 1911, affecting the "wiping rag" industry. Accusations have been made and investigations have proved that some practices now employed are not in keeping with the local laws, which regulate the cleansing, sterilizing and sale and use of materials used for cleaning. To comply with the ordinance, this material must be boiled for forty minutes in a solution containing at least 5 per cent of caustic soda. Before being sold, each package of wiping rags must be plainly marked "sterilized wiping rags," with the number and date of the certificate given by the health officer of the city and county for the operation of the laundry where the material was cleansed and sterilized. Importers of wiping rags, particularly of Asiatic source, shall make advance written notification to the director of public health of each shipment of rags for the San Francisco market. All material shall be subject to inspection and examination by the health department and, on indication, shall be held in quarantine until the proper laboratory examination is completed.

COLORADO

Five Year Cancer Program.—Cancer of the breast will be the theme of the five year program on cancer education soon to be inaugurated by the recently appointed committee on cancer education of the state medical society, according to *Colorado Medicine*. Four teams have been named to present symposiums on the diagnosis and treatment of cancer with emphasis on early diagnosis: Drs. William W. Haggart and Harry S. Finney, Denver, and John B. Hartwell and George W. Bancroft, Colorado Springs (surgeons); Drs. Kenneth D. A. Allen, William W. Wasson and Frederick E. Diemer, all of Denver, and George A. Unfug, Pueblo (radiologists); Drs. Carl W. Maynard and Josephine N. Dunlop, Pueblo, and Wilfred S. Dennis, William C. Black, Jr., and Emeric I. Dobos, all of Denver (pathologists).

CONNECTICUT

Two Cases of Psittacosis.—Two cases of psittacosis have recently been reported in Connecticut, both of which were traced to parrakeets shipped from California, according to the state department of health. October 29, one of two parrakeets recently acquired by a family died after being "droopy" two or three days. The following day one member of the family became ill, and subsequent laboratory tests confirmed the diagnosis of psittacosis. Previously, a parrakeet had died in Connecticut after it had been shipped from California to a retail store in New York and from there to Connecticut. At that time parrakeets had been shipped to eight purchasers in Connecticut from the New York store. An investigation revealed that three had died, and, on recommendation of the health authorities, the others were destroyed.

DISTRICT OF COLUMBIA

Centenary Commemorating Unanue.—The one hundredth anniversary of the death of Dr. Hipólito Unanue (1755-1833), whose bust appears in the Hall of American Heroes in the Pan American Union, was commemorated at a meeting of the Washington Chapter of the Pan-American Medical Association, November 10. Speakers included Dr. Manuel de Freyre y Santander, Peruvian ambassador; Dr. Jose G. Lewis, acting president of the chapter; Dr. Prentiss Willson, president of the Medical Society of the District of Columbia; Dr. George B. Trible, president of the International Medical Club; Dr. Tomas M. Cajigas, president of the Clinical Club of Washington, and Dr. Aristides A. Moll, secretary of the chapter. Unanue is credited with placing the teaching of medicine on a solid basis in Peru through the organization of an anatomic amphitheater in 1791 and of the San Fernando Medical College in 1812.

FLORIDA

Society News.—The DeSoto-Hardee-Highlands County Medical Society was recently addressed in Sebring by Dr. Walter A. Weed, Lakeland, on diagnosis of lesions of the gastro-intestinal tract.——At a meeting of the Duval County Medical Society in Jacksonville, October 3, the speakers were Drs. George F. Oetjen on first aid treatment; Harold D. Van Schaick, head injuries, and Frederick J. Waas, injuries to the abdomen.

Child Health Program.—Recommendations of the Duval County Medical Society for the inauguration by the Jacksonville Health Department of a comprehensive child health program were adopted, October 25, by the city commission, newspapers report. According to the plan, the supervision of the health of children will begin at birth rather than just before entrance into school. Other features include the distribution by the health department, with each birth certificate issued, of schedules of minimum health requirements for infants and children, and the furnishing of blank health records for each child about to enter school, to be filled out by private physicians and returned to the department.

GEORGIA

Encephalitis Reportable.—The board of health of Macon and Bibb County recently amended its regulation governing communicable disease to include encephalitis as a reportable disease. In the future, patients must be isolated and quarantined, while placards will be required on homes where the disease is present.

ILLINOIS

Program for Health Officers.—The Illinois State Department of Health is holding a special program for health officers, December 14-15, in Springfield. Drs. Paul J. Zentay and John W. Eschenbrenner, Jr., St. Louis, will discuss epidemic encephalitis; Drs. Arlington Ailes, LaSalle, Lloyd L. Arnold, Julius H. Hess and Lydia J. Roberts, Ph.D., Chicago, diet and nutrition; and Drs. Jay Arthur Myers, Minneapolis, Robinson Bosworth, Rockford, Thurman B. Rice, Indianapolis, and Gottfried Koehler, Springfield, school health problems. Dr. James P. Leake of the U. S. Public Health Service has been invited to participate in the symposium on epidemic encephalitis. The speakers at the banquet session, December 14, will be Drs. William A. Evans and Allan J. Hruby, Chicago, and Eben J. Carey, Milwaukee. Participating in a round table discussion will be Drs. Howard A. Orvis, Winnetka; Wilmier M. Talber, Decatur; John W. H. Pollard, Evanston; Elmer B. Coolley, Danville, and Harry O. Collins, Quincy, all health officers.

Chicago

Dean Lillie Appointed Distinguished Service Professor.—Frank R. Lillie, Ph.D., dean since 1931 of the Division of Biological Sciences, University of Chicago, has been appointed Andrew MacLeish Distinguished Service Professor in "recognition of his brilliant and fruitful service to the university." There are six endowed professorships for distinguished service in the university. Dr. Lillie, a graduate of the University of Chicago, received the degree of doctor of philosophy from his alma mater in 1894. He has been professor of zoology at the school since 1907 and chairman of the department since 1911. He has been associated with the Marine Biological Laboratory, Woods Hole, Mass., since 1893, becoming president in 1925. He was managing editor of the *Biological Bulletin* from 1902 to 1926. Societies of which he has been president include the American Society of Zoologists, 1905-1908, and the American Society of Naturalists, 1915.

IOWA

Public Health Meeting.—The Iowa Public Health Association conducted its eighth annual meeting, November 22, at Des Moines. The program included a round table discussion on "What Lay Organizations Can Contribute to a Statewide Health Program," under the direction of Dr. Walter L. Bierring, President-Elect, American Medical Association, and commissioner of public health of Iowa. Dr. James P. Leake, U. S. Public Health Service, Washington, D. C., addressed a joint session of the association and the Physicians' Circuit Postgraduate Lecture Course on "The Recent Outbreak of Epidemic Encephalitis in St. Louis." Other speakers included Drs. Albert J. Chesley, St. Paul; Clarence H. Kinnaman, Topeka, Kan., and Milford E. Barnes, Iowa City.

LOUISIANA

Bureau of Credit Established.—The Orleans Parish Medical Society has established a bureau of credit in New Orleans. Should a patient's name be placed on the delinquent roll, which is being compiled, and satisfactory arrangement for settlement of the account is not made within 125 days, legal action will be taken in an effort to collect the fee, it was stated. Members of the society will be required to report monthly to the new department the names and addresses of all patients owing amounts for ninety days or more, if no arrangement has been made for the settlement. This information will be disseminated to all the physicians through monthly delinquent lists. The new plan will not interfere with the continuance of the charity work of the society.

MARYLAND

Dinner to Dr. Hawkins. — The Allegany-Garrett County Medical Society feted Dr. Arthur H. Hawkins, Cumberland, with a dinner at its semiannual meeting, recently. Dr. Hawkins, who was president of the society in 1918, was presented with a silver service.

Home Care for Mental Patients—Emergency Measure. —In an effort to limit admissions to state hospitals, so that existing resources may be used to the fullest extent in the care of urgent and favorable cases, the state board of mental hygiene has asked physicians to urge private hospital care for those patients who can afford it, and home care for those patients to whom the public hospitals can offer only custodial care. The board requests that physicians commit only patients for whom the hospitals offer a chance of successful treatment, or those whose presence at home constitutes a menace. The board points out that, unless this plan is undertaken as an emergency measure, overcrowding and decreasing budgets will reduce hospital service to an almshouse level.

The "Healthmobile."—Seven counties in southern Maryland and on the eastern shore were visited by the "healthmobile" of the bureau of child hygiene of the state department of health on its tour this summer. During the eleven weeks of the tour, eighty-five communities were visited and eighty-nine health conferences were held for the examination of infants and children under school age. Of 1,589 children examined, 1,137 needed follow-up care of some sort, about 216 were underweight and 142 had unhealthy tonsils. Of the total number, 1,341 children were given dental examinations and 767 were treated by the dentist. Of the 614 children between the ages of 5 and 7 examined in preparation for their admission to school, 334 had not been vaccinated against smallpox. The parents were notified that the children would have to be vaccinated before they could be received at any public school in the state.

MICHIGAN

Auxiliary Entertains Society. — The woman's auxiliary entertained the Wayne County Medical Society with a dinner, November 14. The guest speaker was Prof. John Lewis Brumm, director, department of journalism, University of Michigan, on "The Menace of Efficiency."

Course in Electrocardiographic Diagnosis.—The department of postgraduate medicine, University of Michigan School of Medicine, Ann Arbor, gave a five and one-half day course in electrocardiographic diagnosis at the University Hospital, November 6-11, under the direction of Dr. Frank N. Wilson, professor of internal medicine.

State Board Election. — Dr. Theron G. Yeomans, St. Joseph, was elected president of the Michigan State Board of Medical Examiners, October 13, Dr. Jacob D. Brook, Grandville, vice president, and Dr. J. Earl McIntyre, Lansing, reelected secretary and executive officer. Dr. John J. Walch, Escanaba, was reappointed to membership on the board for four years.

Tuberculosis Survey.—With a view to disclosing possible sources of infection, a survey is being carried on in Kent County to determine the incidence of tuberculosis. Dr. Joseph D. Aronson, as a representative of the Henry Phipps Institute of the University of Pennsylvania and of the Rockefeller Foundation, is in charge of the work, which is under the supervision of the state and county health departments.

Mayor Given Honorary Membership. — The Wayne County Medical Society presented a certificate of honorary membership to John W. Smith, acting mayor of Detroit, October 30. The scientific program consisted of a clinical pathologic conference under the direction of Dr. Clarence I. Owen, assistant professor of pathology, Detroit College of Medicine and Surgery. Following the conference, a reception was held in honor of Mr. Smith.

Physician Honored at Home Coming. — Dr. Benjamin Clyne, Yale, was honored in a golden harvest jubilee celebration, November 10, in recognition of the completion of fifty years in the practice of medicine. Mr. George Gough shared the anniversary with Dr. Clyne. A civic holiday was declared by the mayor. The event was in the nature of a home coming, commemorating the work of the pioneers and early settlers of the community where Dr. Clyne and Mr. Gough have lived for many years. More than 200 early residents acted as an honor guard for Dr. Clyne and Mr. Gough, and books containing their signatures and tributes were presented to the two guests of honor. Speakers included Dr. Alpheus F. Jennings, Detroit, and Mr. H. L. Baird, of Lapeer. The principal speaker, introduced by Dr. Donald A. Pollock, was Dr. Udo J. Wile, professor of dermatology and syphilology, University of Michigan Medical School, Ann Arbor, who reviewed the history of the class of 1883, of which Dr. Clyne was a member. Dr. William J. Mayo, Rochester, Minn., is one of the thirty-seven surviving members of the class of 117 students.

MISSOURI

Portraits Unveiled.—Portraits of the late Dr. Joseph S. Lichtenberg, Kansas City, were unveiled at St. Joseph and Menorah hospitals, October 9. Dr. Lichtenberg had been a member of the staff of St. Joseph Hospital for thirty-six years and of Menorah Hospital since its founding.

Centennial Celebration of Beaumont's Experiments.—The one hundredth anniversary of the publication of William Beaumont's "Experiments and Observations on the Gastric Juice and the Physiology of Digestion" was celebrated by the St. Louis Medical Society, November 21, the one hundred and forty-eighth birthday of Dr. Beaumont. The program was as follows:

Dr. Major G. Seelig, Biographical Sketch of William Beaumont.
Dr. Joseph Erlanger, William Beaumont's Experiments and Their Present-Day Value.
Dr. Robert E. Schlueter, Dr. Beaumont as a St. Louisan.
Dr. Louis H. Behrens, Our Civic and Medical Debt to Beaumont.

Photostatic copies of Dr. Beaumont's letters and documents, with other historical objects connected with his life and work, are on exhibition in the society's headquarters. Dr. Beaumont was president of the St. Louis Medical Society in 1840.

In Practice Fifty Years.—A dinner was given by the Clay County Medical Society, October 26, in honor of three members who had completed fifty years in the practice of medicine: Drs. Walter C. Hamilton and John W. Epler, Kearney, and John H. Rothwell, Liberty. Dr. Hamilton, who has practiced fifty-four years, was unable to attend. Dr. Clinton K. Smith, Kansas City, was the principal speaker, and invited guests included Dr. Spence Redman, Platte City, who has practiced in Platte County more than fifty years. October 11, Dr. Robert J. Morton, Clay Center, was feted at a banquet given by seventy-five physicians and dentists of the county, in recognition of his completion of a half century in medicine. Speakers on this occasion included Dr. John T. Axtell, Newton, Kan., and Dr. Jabez N. Jackson, Kansas City, who discussed cancer of the breast. Dr. Morton was formerly state senator.

Cancer Education Campaign.—November 8 marked the opening of a cancer education campaign in Missouri, sponsored by the Missouri State Medical Association, with the initial session presented in Nevada by Drs. Ernest Kip Robinson and Ferdinand C. Helwig, Kansas City. Dr. Joseph T. Hornback, Nevada, councilor of the sixteenth district, presided, and the program was in charge of Dr. Earl C. Padgett, Kansas City. The councilor districts of the state have been divided into five districts, and teams have been organized in various centers. Cancer of the breast will be the topic for discussion this year. Every session will include a public meeting for lay education, a diagnostic clinic for the benefit of the local medical profession, and a scientific program with the county medical societies. At the recent meeting of the state association in Kansas City, the committee on cancer presented a recommendation urging that an educational campaign on cancer for both lay and professional groups be inaugurated in conjunction with the committee on postgraduate course and the state committee of the American Society for the Control of Cancer. The work is in charge of Drs. Padgett, Floyd H. Spencer, St. Joseph; John W. Williams, Jr., Springfield; Marcus Pinson Neal, Columbia, and Ellis Fischel, St. Louis.

NEW YORK

Hospital News. — Memorial Hospital of Greene County, Catskill, was dedicated with formal ceremonies, November 2. Drs. Lyle B. Honeyford, president of the Greene County Medical Society, George L. Branch, chairman of the hospital medical board, and Thomas Parran, Jr., Albany, state health officer, made addresses. The hospital, which was opened for patients in August, has twenty-four beds and ten bassinets.

Society News.—Dr. Richard S. Farr, Syracuse, was elected president of the New York Society of Industrial Medicine at the annual convention in Rochester, November 2. Among the speakers was Dr. Frederic Jay Cotton, Boston, on "Treatment of Elbow Fractures."——Drs. Thomas E. Walsh and Wardner D. Ayer, Syracuse, addressed the Onondaga County Medical Society, November 7, on spondylolisthesis and blood dyscrasias, respectively.

Association of Public Health Laboratories.—At the autumn meeting of the New York State Association of Public Health Laboratories in Albany, November 3, Dr. Rufus I. Cole, New York, was the guest speaker, on "The Outlook for Overcoming Pneumonia." Among other speakers were Dr. Leroy U. Gardner, Saranac Lake, on "Laboratory Diagnosis of Silicosis"; Dr. Ruth Gilbert and Marion Coleman, Albany, "Discovery of Carriers of Pathogenic Micro-Organisms Among Food Handlers," and Dr. Richard J. Lebowich, Gloversville, who reported a case of measles encephalitis. Dr. Ellis Kellert, Schenectady, is president.

New York City

Personal.—Dr. Max Lederer was the guest of honor at a dinner given by the department of pathology of the Jewish Hospital of Brooklyn, recently.——Dr. Oswald Swinney Lowsley addressed the Spanish Urological Society and the French Urological Association on "Surgery of the Kidneys" during a recent trip to Europe.——Dr. William Hallock Park, director of laboratories, New York City Department of Health, was one of five alumni of the College of the City of New York who received the Townsend Harris Medal for achievement at the annual alumni dinner, November 18. This award was established two years ago by the class of 1906 and was conferred for the first time. Dr. Park is a graduate of the class of 1886.

Anniversary of Anesthesia Society.—The tenth anniversary of the American Society of Regional Anesthesia was observed at a special meeting at the New York Academy of Medicine, November 8, called the "George W. Crile Meeting." Dr. Crile delivered a paper on "Anesthetics, Narcotics and the Sick Man"; Dr. Edward M. Livingston, his official address as president of the society, on "Regional Anesthesia: Its Place in Medicine," and Dr. Louis Gaston Labat, an address on "Clinical Manifestations of Sympathetic Disorders and Their Response to Nerve Blocking." Dr. Carl Koller, who in 1884 introduced cocaine into surgical practice, according to the program of the meeting, was also a guest.

Society News.—The Baltimore Medical Club of New York will hold its annual dinner at the Fraternity Clubs Building, December 7. The guest speaker will be Dr. Charles Bagley, Jr., Baltimore, on the history of modern neurologic surgery. Dr. Frank R. Oastler will show lantern slides of Yellowstone Park.——Drs. William Bierman and Homer F. Swift addressed the Harlem Medical Association, November 1, on "Significance and Therapeutic Value of Hyperpyrexia" and "Rheumatic Fever," respectively.——Dr. Jacob Arnold Bargen, Rochester, Minn., addressed the Medical Association of the Greater City of New York, November 10, on "Differentiation of Varieties of Colitis According to Pathology and Management."——Dr. Louis Hausman delivered the third afternoon lecture of the New York Academy of Medicine, November 17, on "Acute Infections of the Central Nervous System from the Standpoint of the Practitioner." Dr. Charles R. Austrian, Baltimore, delivered the fourth, November 24, on "Differential Diagnosis of Pulmonary Disease with Special Reference to Tuberculosis."——A series of eight lectures on "Personality Education and Adjustment in Camp" is being offered to camp directors, parents, counselors and others who plan to engage in camp activities, by the Camp Directors Association of America and the Association for Personality Training. Dr. Ira S. Wile delivered the first lecture, November 21, on "Personality and Mental Hygiene in Camp." They will continue through January 16.——Dr. Charles H. Frazier, Philadelphia, addressed the Bronx County Medical Society, November 15, on "Brain Tumors: Diagnosis and Prognosis."——Dr. Harry Koster delivered a Friday afternoon lecture before the Medical Society of the County of Queens, November 17, on "Diagnosis and Treatment of Peripheral Vascular Disturbances."——Drs. Frederick Tilney and James P. Warbasse addressed the Medical Society of the County of Kings, November 21, on "Medical Problems in Delinquency" and "The Medical Library and Its Relation to Medical Culture," respectively.

NORTH CAROLINA

Society News.—Drs. Stephen W. Davis and Lester C. Todd addressed the Mecklenburg County Medical Society, Charlotte, October 17, on "Idiopathic Hypochromic Anemia" and "Food Allergy with Special Reference to Migraine," respectively. Dr. Archibald A. Barron, Charlotte, addressed the society, October 3, on diagnosis of epidemic encephalitis, myelitis and meningitis.

New Officers of State Board of Health.—Dr. Carl V. Reynolds, Asheville, was elected president of the North Carolina State Board of Health, November 13, and Dr. Sylvester D. Craig, Winston-Salem, vice president and chairman of the executive board. Dr. James M. Parrott, Raleigh, remains secretary. Dr. Hubert B. Haywood, Raleigh, and Mr. James P. Stowe, Charlotte druggist, are new members of the board recently appointed by the governor.

PENNSYLVANIA

Memorial Lecture.—Dr. Russell L. Haden, Cleveland, delivered the Emmerling Memorial Lecture under the auspices of the Pittsburgh Academy of Medicine, November 28. Dr. Haden's subject was "Clinical Significance of Variation in the Erythrocyte of Man."

Society News.—A symposium on diabetes mellitus was presented before the Washington County Medical Society, Washington, November 8, by Drs. Cortlandt W. W. Elkin, Pittsburgh, John W. G. Hannon and Orville G. Lewis, Washington.——A public health meeting featuring Pennsylvania Health Day was held by the Allegheny County Medical Society, Pittsburgh, November 15. Dr. Howard A. McCordock, St. Louis, related "The Story of the St. Louis Sleeping Sickness Epidemic" and Dr. Logan Clendening, Kansas City, spoke on "The Heritage of Medicine." At the November scientific meeting of the society, November 21, papers were presented by Drs. John M. Johnston, on "Failure of the Pulmonary Circulation"; Joseph H. Barach and David H. Boyd, "Generalized Edema, Water Retention and Its Response to Intravenous Acacia"; and Dr. Samuel Glenn Major, "Tumor of the Mouth and Jaw."——Dr. Thomas T. Sheppard, among others, addressed the Pittsburgh Academy of Medicine, November 14, on "Thyroid and Congestive Heart Failure."

Philadelphia

Personal.—Dr. Addinell Hewson, professor of anatomy and histology in Temple University Dental School, was guest of honor at an informal dinner given by the alumni association of the school, October 23.——Drs. Herbert M. Goddard and John H. Frick were guests of honor at a dinner, October 30, given by the Physicians Square Club. Dr. Goddard is president of the national organization and Dr. Frick of the Philadelphia branch.——Dr. William N. Parkinson, dean, Temple University School of Medicine, has been elected a member of the board of trustees of the university.

Society News.—Drs. John T. Farrell, Jr., Louis H. Clerf and John B. Flick will discuss diagnosis and treatment of bronchiectasis at the meeting of the Philadelphia County Medical Society, December 13.—— Speakers before the Northern Medical Association of Philadelphia, November 20, were Drs. Nathan Blumberg, on collapse therapy; Pascal Brooke Bland, intracranial hemorrhage in the new-born, and Fielding O. Lewis, tonsils in relation to systemic infection.——Dr. Ross H. Thompson addressed the Philadelphia Neurological Society on "Encephalomyelitis Disseminata Following an Ascending Neuritis."

TENNESSEE

Personal.—Dr. Oscar S. Hauk, Kingsport, has been appointed medical director of Central State Hospital, Nashville.——Dr. Eugene L. Bishop, state health commissioner, has been appointed director of health for the Tennessee Valley Authority, according to recent newspaper reports.

Society News.—Dr. Warren T. Vaughan, Richmond, Va., addressed the Sullivan-Johnson Counties Medical Society, Bristol, November 1, on allergy in general medicine.——Physicians in Fayette and Hardeman counties recently organized the Fayette-Hardeman Medical Society, with Dr. George T. Brinkley, Fayette Corner, as president. Meetings will be held at the Western State Hospital, Bolivar.——Drs. John L. McGehee and James R. Reinberger, Memphis, addressed the Gibson County Medical Society, Trenton, October 30, on tumors of the breast and toxemias of pregnancy, respectively.——Dr. Thomas D. Moore, Memphis, was elected president of the Walnut Log Medical Society and Dr. Charles Leroy Denton, Dyersburg, reelected secretary at the annual meeting at Reelfoot Lake, October 26. This society is made up of physicians of southwestern Kentucky and northwestern Tennessee.——The first of a series of meetings on child health care sponsored by the Tennessee State Medical Association and the American Academy of Pediatrics was held in Dyersburg, November 1, under the auspices of the Dyer, Lake and Crockett Counties Medical Society. Speakers were the following from Memphis: Drs. William T. Pride, on "Prenatal Care and Its Effect on the Child"; Richmond McKinney, "Effect of Hypertrophied Adenoids and Diseased Tonsils on the Growing Child"; Edward C. Mitchell, "Care of the Well Child," and Laurence J. McRae, D.D.S., "Importance of Child Dentistry."

VIRGINIA

Personal.—Dr. Ernest L. Stebbins, Richmond, of the staff of the state department of health, has been appointed director of the Henrico County health department, succeeding Dr. Allan L. McLean, who recently resigned to become associate professor of preventive medicine at Dalhousie University Faculty of Medicine, Halifax, Nova Scotia.

GENERAL

Wellcome Prize Awarded.—The Wellcome Prize for 1933, consisting of $500 and a gold medal, was awarded by the Association of Military Surgeons of the United States at its recent annual meeting in Chicago to Major Edgar Erskine Hume, librarian of the Army Medical Library, Washington, D. C., for his essay on "The Value of Studies in Health and Sanitation in War Planning."

Society News.—At the annual Mississippi Valley Conference on Tuberculosis in Kansas City, October 5-7, Herbert M. Cass, Huron, S. D., was elected president; Dr. Charles H. Lerrigo, Topeka, Kan., vice president, and A. W. Jones, St. Louis, secretary. Dr. Arthur A. Pleyte, Milwaukee, was chosen president of the Mississippi Valley Sanatorium Association; Dr. William W. Buckingham, Kansas City, vice president, and Dr. David O. N. Lindberg, Decatur, Ill., secretary. The meeting in 1934 will be held in Cedar Rapids, Iowa.

National Academy of Sciences.—The autumn meeting of the National Academy of Sciences was held at Massachusetts Institute of Technology, Cambridge, November 20-22. Among medical subjects of papers were the following:

Allan W. Rowe, Ph.D., Boston, Gaseous Metabolism of Some Dwarfs and Giants.
Dr. Roy G. Hoskins, Boston, The Schizophrenic Psychosis, with Special Reference to Homeostasis.
Henry C. Sherman, Ph.D., and L. N. Ellis, New York, Necessary Versus Optimal Intake of Vitamin G (B_2).
Dr. Simon Flexner, New York, The Nerve Path of Infection in Poliomyelitis and Its Significance.
Dr. John F. Fulton, Jr., New Haven, Conn., Functions of the Premotor Area of the Cerebral Cortex.
Walter R. Miles, Ph.D., New Haven, Conn., Ocular-Rotation Centers for the Two Primary Axes.

Prevalence of Communicable Disease.—The number of cases of poliomyelitis reported to the U. S. Public Health Service for the four weeks ended October 7 for the country as a whole was 1,271, a decrease from 1,412 reported for the preceding four week period. These figures are higher than those for the corresponding period of 1932 but much less than those for the epidemic years 1931 and 1930, when 4,122 and 2,236 cases, respectively, were reported in the corresponding four weeks. Typhoid reached the lowest point for this period in recent years, with 3,093 cases reported, as compared with 3,553 in 1932. The incidence of scarlet fever for the period, 8,107 cases, was approximately the same as for the same period last year but was considerably in excess of the incidence for 1931, 1930 and 1929. The numbers of cases reported in those years were 6,428, 5,220 and 6,198, respectively. The prevalence of meningitis, 130 cases, was the lowest for this period in the five years for which data are available.——Newspapers have recently reported the closing of schools in Matherville, Ill., because of an outbreak of whooping cough; in Vassalboro, Maine, for infantile paralysis, and in Owensville, Ind., for scarlet fever.——Two cases of smallpox, one of them fatal, in El Paso, Texas, led the city health officials to vaccinate 100 nurses and employees in a general hospital to which one of the patients was taken before his illness was diagnosed and thirty-five persons in the business concern where the other was employed.——More than 1,000 children in Dallas were immunized against diphtheria during the week ended November 4 in a fight against increasing incidence of the disease. Thirty-eight new cases were reported during that week, as compared with twenty-nine the previous week.

Deaths in Other Countries

Arthur W. Meyer, chief surgeon of the West End Hospital, Charlottenburg, Germany; known for his operations for pulmonary embolism, November 14, of a bullet wound, self inflicted.——**Ernest Edmund Maddox,** London, ophthalmologist, known for his work in the correction of squint, November 10, aged 73.

CORRECTION

Chronic Ulcerative Colitis.—In Dr. Buie's closing discussion of the article by L. A. Buie and J. A. Bargen (THE JOURNAL, November 4, p. 1466) the clause that reads "From 1,200 patients, 1,816 strains of the organism which we believe to be of etiologic significance" should have read "816 strains."

Foreign Letters

LONDON

(From Our Regular Correspondent)

Nov. 11, 1933.

The Reform of the Medical Curriculum

The agitation for the reform of the medical curriculum continues. The Edinburgh Students' Union held a meeting, which was addressed by Dr. C. M. Wilson, dean of St. Mary's Hospital Medical School. He said that there were two camps in the battle of the curriculum. The majority of teachers were convinced that a student must collect and store as many facts as possible. The minority, to which he belonged, believed that it was impossible to insure the public by merely stuffing students with facts; that, so far as any of us were safe, it was in proportion as our wits worked accurately in emergencies. The five years of the student's life should be devoted to developing his reasoning powers, to training and testing habits of thought, to educate him so that when he went out into the world he might be able to educate himself. The medical schools had become too concerned with the mechanical acquisition of facts. Surgeons complained that students, when they came from the dissecting room into the wards, shed their anatomy like a worn out garment. When they asked the anatomy professor whether his students would not remember their anatomy better if its clinical applications were pointed out, he replied that he was teaching anatomy as a pure science. But such shedding of anatomy pointed to sheer bad teaching. The student suffered from a glut of talking, which was not teaching. The evil of modern medicine was that it was too much removed from the bedside.

Dr. Wilson also attacked the examination system. Dr. Dickson, a member of the British Medical Association special committee on medical education, said that the curriculum should be directed to the turning out of the general practitioner, not of the specialist. His general education must be of a high order. He must acquire a sound knowledge of the elementary medical sciences, of which the teaching should be of an applied and coordinated character. He should be a specialist in minor injuries and minor surgery generally, familiar with common diseases, and have a thorough practical knowledge of midwifery. Far too much time was spent in the dissection of the dead body.

The following resolution was adopted unanimously: The present system of medical education is unsatisfactory. Important changes in the curriculum are essential, whereby more facilities for instruction in practical medicine should be available and more assistance given in the principles and practice of preventive medicine. The time for this can be obtained by modification of the teaching in the earlier scientific subjects, with some revision of the time devoted to the special departments of medicine and surgery.

The Osteopaths

The agitation for the recognition of osteopaths continues in the columns of the *Times*. Persons write the usual letters to the effect that after the medical profession failed to benefit them they were cured by osteopaths. The profession is accused of prejudice. But Lord Moynihan points out that no more importance can be attached to "unorthodox" medicine than to "unorthodox" chemistry or "unorthodox" physics. Medicine is at last based on foundations common to all science. He does not deny to the osteopath some competence in manipulative methods. The profession does not grudge him success, though it recognizes its infrequency and is not unfamiliar with its perilous accompaniments and its fatal disasters. Opposition rests on something more fundamental: on his complete lack

of adequate training in the most elementary principles, which underlie all diagnosis, and in application of those principles in directing treatment. Such principles are based on a multitude of sciences—anatomy, physiology, pathology and the like—and on that trained clinical observation which seeks to determine not only the morbid local condition but also its correlation of the patient. Only by such inquiry can trustworthy diagnosis ever be made, and without it empirical treatment is haphazard. The expert application of a method, good perhaps in itself but unsuited to the local or general condition, can bring no advantage and may do irreparable harm. The practitioner who has failed to pass through a full curriculum is devoid of sufficient knowledge of disease or of the methods by which apparently similar maladies can be differentiated. This accounts for the frequent disasters of osteopathic treatment. Those who practice "unorthodox medicine" are not practicing "medicine" at all. They are as competent to do so as a student would be who spoke in terms of higher mathematics and did not know elementary arithmetic.

Dr. Farquhar Buzzard, regius professor in the University of Oxford, in discussing the claim of the osteopaths for registration points out that the object of the Medical Register is to enable any one seeking medical aid to distinguish practitioners who have had sufficient training for the safety of their patients from those who have not. If there were a register of osteopaths or of chiropractics the layman would assume that his health was safe in their hands. Osteopathy is fighting a losing battle in America against rival cults, which have the advantage of novelty. Osteopathy is based on the theory that most, if not all, diseases are caused by the pressure of misplaced bones on nerves and vessels and can be cured by replacement. However attractive by reason of its simplicity, this theory is contradictory to the principles of pathology as taught in every medical curriculum in the civilized world.

PARIS

(From Our Regular Correspondent)

Oct. 18, 1933.

International Congress of Plastic Surgery

The annual period of congresses has begun. Since the close of the vacation period and before the opening of the universities, various special societies have held their congresses, some being of international scope. The halls at the Faculté de médecine, which are always at their disposal, are scarcely adequate for the many sessions. As some of the congresses are held simultaneously, a report cannot be given until after the publication of their proceedings. That is the case with the Congress of Surgery, which lasts a whole week.

The Congress of Reparative and Esthetic Plastic Surgery is a comparatively small congress, although its importance is increasing from year to year, which is peculiar, since its field is rather restricted. This year the congress was international and many foreigners attended. The sessions lasted two days, under the chairmanship of Prof. Jean Louis Faure and Dr. Dartigues, its founder. Colonel Picot, president of the Association des mutilés de la face, victimes de la guerre, and member of the chamber of deputies, sat on the platform, with a face frightfully slashed, a living witness of the need of reparative and cosmetic surgery. Prof. Jean Louis Faure, in his presidential address, pointed out the shackles with which, all too often, the courts retard the development of plastic surgery, when they impose crushing penalties on unfortunate operators, on the pretext that cosmetic interventions are not resorted to for the sake of saving lives. Heavy fines are frequently imposed on operators when their clients do not obtain the results they anticipated. Cosmetic surgery, Professor Faure emphasized, has become more dangerous for the surgeons than for their clients. Professor Manna of Rome spoke on the same subject and demanded that the limits of the responsibility of the surgeon in such matters be clearly defined. Dr. Bourguet presented the results of his research on the plastic surgery of the nose and the ears. Dr. Eckstein of Berlin spoke on the surgery of the face and the neck. Dr. Claoné of Paris, Dr. Burian of Prague and Dr. Lluesma Uranga of Madrid presented different types of mammary surgery and repair of the breast, in which connection an excellent sound film of Dr. Dartigues was projected. More than forty communications were read on widely different topics.

Meeting of French-Speaking Radiologists

The Congress of French-Speaking Electrotherapeutists and Radiologists was held for the first time, under the chairmanship of Dr. Belot, who was assisted by Professor d'Arsonval, sometimes called the father of modern electrotherapy by reason of his discovery of the high frequency currents and the short waves. Among the foreigners present was Mr. Coolidge, creator of the Coolidge tube. An important paper was presented by Ledoux-Lebard and Garcia Calderon on the technic of the radiologic exploration of the mucosa of the large intestine. Gilbert and Karnka of Geneva described the clinical results of the lesions revealed by this exploration. The second communication, offered by Professor Rechou of Bordeaux, was designed to explain the new applications of short and ultrashort waves in therapeutics.

At the close of the congress, special ceremonies were held at the Hôpital de la Pitié, during which Professor d'Arsonval bestowed a plaquette on Dr. Delherm, head of the department of electroradiology, at the Hôpital de la Pitié, in honor of his twenty-five years of hospital service.

Congress of Gynecologists and Obstetricians

The Association des gynécologues et obstétriciens, presided over by Mr. Henrotay of Antwerp, met in Paris, October 7, under the chairmanship of Professor Couvelaire. In his presidential address the latter vehemently opposed the practice of subjecting certain persons to compulsory sterilization. It is a mystic idea to expect to improve the quality of a race by such absolutely arbitrary methods. Many men of genius have been the offspring of degenerates and neuropaths. While eugenics is a legitimate ideal, it should be based on different conceptions.

The first topic on the program was the surgical treatment of placenta praevia, on which Paucot of Lille and Reeb of Strasbourg presented papers. In a series of 1,724 cases, they found that the mortality of mothers, as a result of obstetric methods, amounted to 7.82 per cent. They emphasized that wide rupture of the membranes is responsible for only 2.40 per cent of the mortality in mothers and constitutes therefore a preferred form of treatment. The child mortality ranges around 51 per cent, although it is only 34.5 per cent in wide rupture of the membranes. The statistics for the surgical methods reveal the somewhat discouraging figure of 9.11 per cent of mortality among the mothers in a series of 477 interventions; but the statistics extend over the last ten years and, if one considers only the low cesarean operation, the mortality is only 4.33 per cent. The low cesarean operation is thus shown to be the preferred method, so long as it is employed by surgeons only in from 10 to 30 per cent of the cases of hemorrhage. The child's chances have improved, since the stillbirths have dropped to 22.42 per cent. The speakers stated that hemorrhages due to low insertion of the placenta do not justify the systematic use of surgical methods; such methods are indicated chiefly because of wide rupture of the membranes. With this exception, one should resort to surgical methods. The low cesarean operation has been shown to be superior to any other treatment from the standpoint of the safety of the child. Hysterectomy is a procedure to which it is sometimes absolutely

necessary to resort to save the life of the mother. A long discussion followed. The two camps represented by the advocates of surgical intervention and the defenders of perforation of the membranes, with recourse, in case of grave hemorrhage, to the transfusion of blood, held their ground. Professor Brindeau favors the conservative low cesarean operation in infected cases when transfusion has been ineffective. Professor Hauch of Copenhagen remains loyal to the Braxton Hicks maneuver and to the balloon dilator, although he admits that the fetal mortality is higher. He favored, however, more low cesarean operations. Metzger, Cathala, Leroux (Nantes), Essen Moeller (Sweden), Masson (Bordeaux), Keller (Strasbourg), Cova (Turin), Delmas (Montpellier), Arricaza (Spain), de Snoo (Utrecht), Snoeck (Brussels), Labhardt (Basel) and Levy-Solal described in turn their preferences. The discussion led to no definite conclusion unless it is that the obstetrician should allow himself to be guided by the events.

The second topic on the program was pelvic tuberculosis, and four papers by Moulonguet, Brocq, P. Gibert (Lausanne) and Rochat (Lausanne) were presented. The blood origin of this form of tuberculosis is no longer questionable, and its beginning in the tubes is equally certain. Under such conditions marriage is contraindicated. Tuberculosis of the cervix is the least frequent, that of the adnexa the most frequent (80 per cent). The diagnosis is difficult. Brocq reported good results, in cases with ascites, from simple laparotomy followed by prolonged heliotherapy. Gibert recommended the use of ultraviolet rays in preparing the patient for operation and also following the laparotomy. Professor Daniel of Bucharest opened the discussion by citing 266 operative cases, 60 per cent of which presented simple genital lesions and 40 per cent peritoneal lesions. Mr. Muret (Lausanne) confirmed that the uterus is affected in 50 per cent of the cases. He advocated conservative surgery and highly endorsed heliotherapy. Mr. Villard (Lyons) is an advocate of surgical treatment, but the operation must be adapted to the anatomic forms, must be conservative and must avoid the risks of intestinal perforation. J. L. Faure said that hysterectomy must be resorted to in the grave cases.

The last paper, on "Treatment of Disorders Following the Artificial Menopause," upheld the hormone method of treatment and that of grafts. The disorders of the surgical menopause are essentially vasomotor or rheumatismal, but sometimes of a nervous or psychic order. Organotherapy gives good results in the former cases but is less certain in the latter. It should be applied early, immediately after recovery from the operation, on nine or ten days each month, at a time corresponding to the date of the menses.

BERLIN

(From Our Regular Correspondent)

Oct. 16, 1933.

Fruit Juices in the Diet of Patients

Prof. Carl H. von Noorden, an authority on metabolism, has issued some interesting statements on the value of unfermented fruit juices in the diet of patients. In most fruits, unless enriched by the addition of sugar, the caloric content is too low to constitute the major portion of the total food requirement for an adult. In latitudes with a hotter climate that furnish products with a high sugar content (figs, dates, bananas, oranges, grapes, sugar cane, melons, pineapples), these may supply often more than half of the food requirement. In Germany, the home-grown fruit, on the average, might cover from 10 to 12 per cent of the total food requirements of the German population, while the imported fruits might contribute almost 10 per cent more. In Germany, fruit plays the part of a highly valuable supplementary food. The enjoyment derived from eating fruit comes not only from the sugar content but also from the weak organic acids, present in varying proportions, and from the abundance of savors. The mineral substances in the most common varieties of fresh fruits amount to only from 0.5 to 0.75 per cent of the weight. They are, however, of considerable value, because they occur in different proportions than in animal foods, vegetables and cereals. Of great significance for the diets of certain patients is the fact that most fruits have a low sodium chloride content. The vitamin content is important. In their abundance of vitamins, combined with a manifold composition, tomatoes offer a valuable addition to the diet. Tomatoes may be said to constitute a transition between a fruit and a vegetable. The expressed juice of most of the larger fruits is poor in vitamins, since the latter are contained chiefly in the seeds and in the outer covering. Oranges and tomatoes, however, are an important exception, since their expressed juices contain most of their vitamins. Since in most countries, except for the tropical regions, fresh fruits are gathered only at certain seasons, and then usually in such large quantities that it is difficult to dispose of them before they deteriorate, it is a common practice to convert them into a more stable form. The conversion of the expressed juices of fruits into alcoholic beverages by a process of fermentation usually takes care of most of the surplus. For healthy persons unfermented fruit juices are valuable as supplementary food by reason of the caloric content, which, if the sugar content is high, may equal that of the best whole milk, and with average sugar content will correspond to two-thirds that of whole milk. Another good effect of an abundant ingestion of fruit and of fruit juices is the prophylaxis against diarrheas. Von Noorden emphasized that there is no other food substance that so quickly, so emphatically and so immediately provides the muscles with energizing material as the types of sugar contained in fruit juices. Every other type of food, including ordinary table sugar, requires previous transformation through digestive processes.

An extensive use of unfermented fruit juices is to be considered in selecting the diet for a patient; for example, in acute and chronic infectious diseases, in which, to be sure, theoretically a selection of various food products is to be recommended but, from the practical point of view, a patient often gives evidence of loss of appetite, which may prevent the application of a mixed diet. Well cooled fruit juices and sweet ciders or musts, as a supplement to or in place of fresh or cooked fruits, sit lightly on the stomach and increase the desire for other food. A patient confined to bed may often be given up to 1 liter of unfermented cider or must during the twenty-four hour period, which will usually supply about one fourth of the total food requirement. Another important effect, which is produced by no other food that is admissible in grave disease conditions, is the action on intestinal activity. If this effect is desired to a marked extent, certain conditions, easy to fulfil, must be observed; the fruit juices, namely, must be taken early in the morning, on an empty stomach. For this purpose, from 0.25 to 0.3 liter is sufficient, the whole amount, well cooled, being taken within a few minutes. Von Noorden called attention also to the good effects of fruit juices on renal activity, especially in feverish patients and in disturbances of the circulation. The effect is at least as great as (usually greater) and certainly more conservative than the action of numerous so-called diuretic teas of the older materia medica. This effect is often striking in feverish patients who are inclined to perspire; for example, in tuberculous patients. If, by means of fruit juices, ample diuresis is produced and waste products are thus washed away, the weakening sweats often subside quickly, to a great extent, although not always, since the cause of the condition varies considerably. Even more striking is the cessation of the troublesome sweats occurring in obese patients, as soon as it proves possible, by means of fruits and fruit juices, with exclusion of other foods, to increase markedly the elimination of fluids and salts through the kidneys.

Births, Deaths, Marriages and Divorces in Prussia

Attention was called recently to the great decline in the birth rate and to some of the measures that the federal government has adopted to increase the number of marriages. In recently published figures for Prussia during the first quarter of 1933, a further marked decline in the birth rate is reported, there having been only 157,079 births, or 5.5 per cent fewer than for the corresponding quarter in 1932. On the other hand, there were 142,531 deaths, or 16 per cent more than for the corresponding quarter in 1932. The excess of births over deaths had dropped to 1.5 per thousand, as against 4.4 per thousand in 1932. The number of marriages was 59,555, or 6 per cent fewer than in 1932. It may be added that the recent financial aid given to brides who fulfil certain conditions was not in operation at that time.

In Prussia in 1932 there were 31.4 divorces for each 10,000 marriages, as against 30 in 1931. Two thirds of the divorces were granted in large cities, Berlin having reported a rate of 85 per 10,000 marriages. In one half of the divorces, the husband was declared to be the guilty party; in one third of the cases both the parties to the marriage contract were declared guilty, and in only one sixth of the divorces was the wife found to be the guilty party. In considering these statements, account must be taken of the peculiar laws in force in Germany. This high divorce rate affects not only so-called inflation marriages (that is, belonging to the period immediately following the war) but 13 per cent of the divorces concern prewar marriages, many of which had been contracted more than thirty years previously. Only 8 per cent of the divorces in 1932 involved annulment of marriage contracts entered into during the war.

PRAGUE

(From Our Regular Correspondent)

Oct. 27, 1933.

Changes Recommended in the Curriculum

The report of the committee for the reform of medical study headed by the dean of the Brno faculty of medicine, Prof. Bohuslav Bouček, has been published. The report deals in its first part with fundamental problems in the present crisis in medical education. The main requirement for improvement in the present overcrowding of medical schools is a proper regulation of the admission of students. According to the report, the number of medical students admitted to the faculty of medicine should be reduced to the actual need for new practitioners in the country and to the actual teaching capacity of the respective faculties of medicine. Another radical change which the report recommends is the concentration of study in a given period of time on a certain subject, in contrast with the present system of teaching a diversity of topics to students simultaneously. The report sees a great advantage in this concentration not only to the medical student who will be able to devote himself fully to one subject after another but also to the teaching staff, as only a portion of the year would be allocated to teaching, the rest of the time being free for scientific work and research. The report expects that more individual instruction will result from the measures recommended. The examinations of the present day will be replaced by long time observation by the teaching staff, with the final examinations becoming a mere formality. The report anticipates financial difficulties in connection with this reform but maintains that a radical improvement in the education of medical students is not possible unless the numerical relation of the students to the teaching staff is radically altered. The medical curriculum proposed in the report would cover two years devoted to theoretical studies and three years to clinical studies. The teaching year is subdivided into three trimesters. Each one of the trimesters would have twelve full weeks of work, with the last week devoted to examinations. The schedule of the day's work prescribes as a first lesson for every day an hour and a half of lecturing followed by an hour and a half of practice. The morning session is terminated by another lecture of an hour and a half by assistants in the respective medical subjects. The subordinate teaching staff is emphasized in the report in contrast to the present situation, in which most of the teaching is in the hands of the chiefs of the respective departments. The afternoon session follows the same schedule. Among the subjects recommended for the first two years of theoretical studies, a special curriculum on nursing is a novelty. According to the report it should be an introduction to hospital work in connection with the topics that are presented today under the heading "medical propedeutics." All examinations in the theoretical subjects should be over by the end of the second year, so that clinical work would start immediately with the beginning of the third year. This is a great advantage over the present method, whereby usually the first half of the third year is lost on examinations in theoretical subjects. The three clinical years are divided so that the mornings are devoted to hospital work and the afternoons to such theoretical subjects as pathologic anatomy, hygiene, experimental pathology and pharmacology. Social medicine is introduced as an obligatory subject in the three clinical years. The report of this committee represents the most complete project for the reform of medical study that has been presented in Czechoslovakia. It should be an important step toward reform. The committee consisted of serious and honored members not only of the teaching staff of the faculty of medicine of Brno but also of representatives of medical organizations and prominent practitioners.

International Meeting of Otorhinolaryngologists

A session of the Collegium Otorhinolaryngologicum Amicitiae Sacrum was held in Prague in September, with Prof. Antonin Přecechtěl in the chair. This is an international association founded on the initiative of Dutch otorhinolaryngologists. The membership of each country is limited to ten persons carefully selected according to their scientific qualifications. The annual session held in various capitals is usually of a high scientific standard. The Prague session was attended by forty-nine members, representing fifteen different countries, including the United States. Germany did not send its representatives, as was customary in preceding years. The main feature of the session was a report by Prof. S. J. Crowe of Baltimore, who spoke on the Wever-Bray phenomenon on the basis of extensive experimental data. The experience gained at this session showed again that similar meetings in which the membership is limited to selected experts has more value for the advancement of knowledge than meetings with a large audience with varying standards of knowledge and experience.

A Region Not Affected by the Depression

A conference on a regional public health plan was held, October 15, in the city of Zilina, which is the seat of the largest shoe factory on the continent. The flourishing shoe industry has brought to this region powerful financial means, which are to be used to help develop the whole territory of eastern Moravia. This section of Czechoslovakia is hilly and has poor natural resources. The health standard of the population has always been low. Endemic goiter is present in the higher sections, while in the valleys hyperthyreosis prevails. At this meeting a committee was organized to study the public health problems of the territory and to provide with the assistance of economists, geologists, architects and agriculturists a plan for the development of this territory. It appears that a great deal of the preliminary work has already been accomplished.

An encouraging part of the program is that the region has not been affected by the economic depression, because the local shoe industry was able to maintain employment on a high level. This experiment deserves the interest of the medical profession, because the initiative in the undertaking is in the hands of physicians and the whole plan will be formulated on the basis of public health requirements.

New Rules of Ethics

New ethical rules have been published for the chamber of physicians of the province of Bohemia. They prescribe loyal obedience to the chamber and an ethical attitude toward patients. A physician is allowed to practice in only one community. He may visit a patient in another place only in case he is called there, but he cannot maintain another office there. A physician's office sign shall contain only his name, his office hours, his degrees and the type of practice he is engaged in under the rules prescribed by the chamber. A physician is not allowed to place his sign on any other building than his own house. He is not allowed to place any other information on his stationery or other printed matter. The same applies to advertising, which is allowed only for three months after the opening of practice or for three weeks after any change of his practice. Advertising through the distribution of leaflets to the public is strictly forbidden. Physicians are allowed to circulate leaflets about their practice only to physicians of their territory when they start practice or if any change in its form takes place. Any other form of concealed advertising, such as articles or visits, is prohibited. The splitting of fees and remunerations for referring patients is a serious offense against the rules. Medical fees must be kept within the limits prescribed by the chamber. Treatment without a personal physical examination of the patient is not allowed. A physician can apply for appointment only if there is a vacancy in a position. A physician must not undertake the treatment of a patient who is being treated by another physician. This does not apply to first aid. An exception is allowed also in case the patient visits the physician in his office. In case several physicians are called, the one who arrives first takes over the treatment of the patient. Inspection visits prescribed by insurance societies must be made only in the presence of the attending physician. In case a medical practitioner is sick or absent, the physician who replaces him is obliged to defend most conscientiously the interests of his colleague. Every physician is obliged to assist another physician in case of necessity. A consultation with other physicians must be granted by the attending physician if the patient requests it. The consulting physician must safeguard conscientiously the interests of the attending physician. The consulting physician is not allowed to take over the patient as his own. No physician is allowed to criticize or qualify in any way the medical work done by another physician in the presence of a patient.

Death of Professor Slavík

Dr. Vladimír Slavík, for many years professor of legal medicine at the Czech faculty of medicine of Prague, died at the age of 67 years. He obtained a medical degree in 1892 and immediately took up the study of legal medicine under the guidance of Professor Reinsberg, his great teacher and predecessor in the chair of legal medicine. After five years of research work, he began lecturing on legal medicine and continued his work at the Institute of Legal Medicine of Prague until he became its chief in 1908. During his twenty-five years as head of this institution he built it up technically and scientifically. He was twice dean of the Czech faculty of medicine of Prague and in 1928-1929 served as rector of the entire university. Reinsberg can be considered the founder of the Czech school of legal physicians, while Slavík was the one who translated his theories into practical application. A treatise on sudden death as a problem of legal medicine opened his scientific career. Another large volume of his deals with the diagnosis of poisoning in the practice of legal medicine. His most popular work is a textbook on legal medicine, which became a standard reference book for medical students and lawyers. He was well known as a friend of students and for many years served as curator of the Mensa Academica in Prague. For a time he served also as a secretary of the Central Organization of Czech Physicians and as editor of the periodical *Časopis lékařů českých.*

RIO DE JANEIRO

(From Our Regular Correspondent)

Sept. 15, 1933.

Criteria for the Discharge of Lepers

Dr. Nelson Souza Campos, in a communication to the Paulist Association of Medicine (*Ann. paulist. de med. e cir.*, September 3) stated that the inspectors have conditionally discharged during July thirty-three leper patients as offering no more danger to the public health. It is the first time that this has happened in Brazil and the credit for it goes to São Paulo, which has the best and most complete organization to treat leprosy in this country.

The criteria for the discharge of a leprous patient are as follows: The patient is carefully examined clinically, dermatologically and bacteriologically. He receives six months of treatment, after which he is again examined. If found negative, he is classified "under observation" and, during the subsequent six months, he is subjected to a monthly bacteriologic examination, after reactivaton has been brought about with potassium iodide. If still negative, he is transferred to a pavilion for "closed forms" of leprosy, which is at present the Sanatorium of Padre Bento, where he is subjected to treatment for six months and monthly examinations. Consequently, this represents twelve negative examinations after reactivation and after being interned eighteen months. Clinically, his active lesions must have disappeared. He is then examined by a commission of specialists and may be discharged conditionally. During the next three years he has to submit himself every three months to clinical and bacteriologic examinations, after which he is discharged permanently. A positive examination or the appearance of any active lesion annuls all the prerogatives acquired and the patient is again considered "under observation."

A Medical Congress

The Paulist Association of Medicine has decided to promote, in November, a congress for the study of questions of medical-social interest. There will not be issued any special invitations and all physicians, whether or not a member of the society, may participate if they decide to collaborate in any way in the scientific objectives of the congress. Individuals or societies should communicate with the secretary of the association for registration and payment of a special fee giving them the right to participate in the proceedings and to a copy of the proceedings. The subjects chosen for discussion are: 1. The Hospital Problem in the State of São Paulo. 2. Inflammatory Processes of Biliary Ducts. 3. Mega-Esophagus. 4. Treatment of Syphilis in Infancy. 5. Neurosurgery in São Paulo. 6. Treatment of Gonorrhea. 7. Value of Otorhinolaryngology in School Hygiene. 8. Menstrual Disturbances. 9. Exanthematous Typhus in São Paulo. 10. Collapse Therapy of Pulmonary Tuberculosis.

The Leukocytes and the Prognosis in Appendicitis

In a communication to the Brazilian Society of Internal Medicine on the leukocytic formula in appendicitis, Dr. Moreira da Fonseca presented two leukocytic indexes that aid in the

prognosis in acute appendicitis. The author called the first index the leukoneutrophil quotient and it represents the relation between the number of leukocytes and the percentage of polymorphonuclear neutrophils. Normally it averages in this country from 100 to 150, and when it drops to from 75 to 100 it is a sign of aggravation of the disease; when it is down to from 75 to 50 it indicates gangrene or perforation of the appendix. When this quotient is below 50 the patient probably will not recover. A leukoneutrophil quotient above 250 is a sign of suppuration if at the same time there is a leukocytosis. The second index, the karyoneutrophil quotient, represents the relation between the number of nuclei in 100 polymorphonuclears and the percentage of these leukocytes. It is based on the Arneth index and on the percentage of neutrophils. In this country the number of nuclei in 100 polymorphonuclear neutrophils is usually 300 and the percentage of neutrophils varies between 55 and 65. The normal karyoneutrophil quotient is from 4 to 5. The lower the quotient, the worse the appendicitis.

A New Leprosy Society

Through the initiative of the board of directors of the Sanatorium Padre Bento and with the assistance of the auxiliary inspector of prophylaxis of leprosy of the public health service, there was established in August a Paulist Society of Leprology to encourage the study of leprosy. Various subjects were discussed pertaining to the life of the new society.

Marriages

Wade Saleem Rizk, A. Surg., Lieut. (j. g.) U. S. Navy, to Miss Lois Durban Greiner of Kalispell, Mont., November 3.

Ralph Bernard Mullenix, Iowa City, to Miss Helen McCormick of New Auburn, Wis., in Chicago, October 14.

George Washington Holmes, Winston-Salem, N. C., to Miss Lucille Stokes Feild at Richmond, Va., September 9.

James Nelson Dawson, Lake Waccamaw, N. C., to Miss Marjorie Robinette Goodwin of Wilmington, August 2.

Alexander Stuart Moffett, Murfreesboro, Tenn., to Miss Virginia Billings of Nashville, November 1.

Lonnie Bondurant Moseley, Jackson, Miss., to Miss Frances Ransom of Aberdeen, September 5.

John M. McDonald, Attica, N. Y., to Miss Hazel Kern Huffman of Niagara Falls, November 4.

Alvin Leroy Mathis, Elmhurst, Ill., to Mrs. Sue Ellen Lay Baisch of Oak Park, September 14.

Alford Gordey Hendrick, Atlanta, Ga., to Miss Pauline Brown in El Paso, Texas, October 14.

William Louis Patman, Greensboro, N. C., to Miss Nellie Fuller Gaskill at Greenville, October 31.

Louis Henry Swerlitsch, Coraopolis, Pa., to Miss Pauline E. Reed of Fair Oaks, recently.

John Keller Mack, St. Louis, to Miss Grace M. Smith at Webster Groves, Mo., September 2.

Herman Edwin Martin, Sandy Hook, Ky., to Miss Amelia Duley of Morehead, in September.

Emmett August Meili, Cochrane, Wis., to Miss Cleo F. Maher at Durand, September 18.

Edwin Russell Jacka to Miss Kathryn Lenore Grannis, both of Pioneer, Ohio, recently.

Charles H. Nichols, New York, to Miss Helen Davy of Nashotah, Wis., November 1.

Walter Lewis Nalls to Miss Aileen Lee Williams, both of Richmond, Va., October 14.

Arthur Burnham Johnson to Miss Betty Gruenberg, both of Toledo, Ohio, October 7.

Linwood Farley, Courtland, Va., to Miss Evelyn Byrd Nelson, September 23.

Harley E. Henry to Miss Ruth Conwell, both of Brownsville, Pa., October 27.

Deaths

George Lyman Richards ● West Dennis, Mass.; Harvard University Medical School, Boston, 1886; Chairman of the Section on Laryngology and Otology, American Medical Association, 1902-1903, and Delegate in 1904; member of the Rhode Island Medical Society, the American Laryngological Association, American Laryngological, Rhinological and Otological Society, American Otological Society and the New England Otological and Laryngological Society; fellow of the American College of Surgeons; member of the state board of registration in medicine, 1913-1916; at one time director of the American College for Girls in Smyrna, Turkey; formerly on the staffs of the Union Hospital, Fall River, Fall River (Mass.) City Hospital and the Cape Cod Hospital, Hyannis; author of "Nose and Throat Work for General Practitioner"; on the editorial board of *Annals of Otology, Rhinology and Laryngology;* aged 70; died, November 9, of cardiac decompensation and cerebral edema.

John Ferdinand Golden ● Chicago; Northwestern University Medical School, Chicago, 1903; clinical professor of surgery, LoyolaUniversity School of Medicine; fellow of the American College of Surgeons; clinical assistant in surgery, Rush Medical College, 1904-1906; instructor in surgery, 1906-1910, and associate in surgery, 1910-1920, at his alma mater; on the staff of the Mercy Hospital; aged 53; was killed, November 20, when he fell from an eighth story window.

William A. Edwards, El Cajon, Calif.; University of Pennsylvania School of Medicine, Philadelphia, 1881; an Affiliate Fellow of the American Medical Association; fellow of the American College of Surgeons; formerly professor of pediatrics, University of California College of Medicine, Los Angeles; aged 73; died, November 15.

Howard Rankin Weirick, Hibbing, Minn.; Columbia University College of Physicians and Surgeons, New York, 1896; formerly mayor, village president, health officer and member of the state board of health; on the staff of the Rood Hospital; aged 61; was accidentally shot and killed, October 20, while examining a revolver.

Osee C. Butler, Seminole, Okla.; University of Arkansas School of Medicine, Little Rock, 1917; member of the Oklahoma State Medical Association; past president of the Seminole County Medical Society; served during the World War; aged 47; died, October 27, in a hospital at Oklahoma City.

Edward Parish Lacey, Bessemer, Ala.; Vanderbilt University School of Medicine, Nashville, Tenn., 1883; member of the Medical Association of the State of Alabama; fellow of the American College of Surgeons; on the staff of the Bessemer General Hospital; aged 77; died, October 22, of uremia.

John Thompson McLean ● Captain, E. O., U. S. Army, retired, Long Beach, Calif.; Memphis (Tenn.) Hospital Medical College, 1898; served during the World War; aged 60; died, September 7, in the Veterans Administration Facility, San Fernando, of pulmonary tuberculosis.

George Leedom Peirce, Elkins, W. Va.; University of Louisville (Ky.) School of Medicine, 1894; member of the West Virginia State Medical Association; served during the World War; on the staff of the Elkins City Hospital; aged 61; died, September 26, of diphtheria.

Whiting Sweeting Worden, Yokohama, Japan; Syracuse (N. Y.) University College of Medicine, 1886; formerly a medical missionary; for many years physician to the American consulate at Yokohama and to the Japanese royal family; aged 74; died, October 17.

John Francis O'Brien ● Boston; Harvard University Medical School, Boston, 1892; member of the New England Otological and Laryngological Society; medical superintendent of the Sanatorium Division of the Boston City Hospital; aged 66; died, October 27.

Harry Wynne Browning, Little Rock, Ark.; University of Arkansas School of Medicine, Little Rock, 1911; member of the Arkansas Medical Society; aged 48; on the staff of St. Vincent's Infirmary, where he died, November 3, of heart disease and uremia.

Eugene Larkin Lawrence, Thorndale, Texas; University of Nashville (Tenn.) Medical Department, 1907; served during the World War; formerly city health officer and member of the state board of health; aged 56; died, September 29.

Harold MacDonald, Schenectady, N. Y.; Albany (N. Y.) Medical College, 1910; member of the Medical Society of the

State of New York; served during the World War; aged 48; died, November 2, of heart disease.

Augustus William Foy, Denver; University of Michigan Medical School, Ann Arbor, 1892; aged 74; died, November 6, in the Denver General Hospital, of injuries received when he was struck by an automobile.

Frank Moseley, Williamson, W. Va.; University of Tennessee College of Medicine, Memphis, 1915; served during the World War; aged 48; died, October 4, in Hot Springs National Park, Ark., of heart disease.

Harris James Milliken, Bangor, Maine; Medical School of Maine, Portland, 1904; member of the Maine Medical Association; aged 55; died, October 4, of chronic myocarditis and chronic interstitial nephritis.

Alfred Guido Rudolph Castles, Los Angeles; Rush Medical College, Chicago, 1871; aged 82; died, August 8, in the Hollywood Hospital, of cerebral embolus, abscess of the kidney and hypertrophied prostate.

Henry Albert Wolff, Pasadena, Calif.; College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1877; aged 80; died, October 30, of carcinoma of the gallbladder and liver.

Thomas Fillis Goodwin ● Mount Vernon, N. Y.; University of the City of New York Medical Department, 1879; on the staff of the Mount Vernon Hospital; aged 78; died, November 2, of angina pectoris.

George C. McClure, Ball Ground, Ga.; University of Georgia Medical Department, Augusta, 1901; aged 63; died, in October, at a hospital in Canton, of an overdose of medicine, taken accidentally.

Howell Venable Armistead, Newman, Calif.; University of California Medical Department, San Francisco, 1885; member of the California Medical Association; aged 74; died, September 12.

Joseph Herman Castleman, Gladeville, Tenn.; Vanderbilt University School of Medicine, Nashville, 1920; aged 42; died, November 6, in the Martha Gaston Hospital, Lebanon, of pneumonia.

Franklin Deo Sinclair ● Oswego, N. Y.; Eclectic Medical College of the City of New York, 1896; on the staff of the Oswego Hospital; aged 62; died, October 29, of heart disease.

Eldon E. Lewis, Port Huron, Mich.; New York Homeopathic Medical College, 1884; aged 73; died, November 2, in a hospital at Detroit, of chronic myocarditis and arteriosclerosis.

James Osborne De Courcy, St. Louis; Hospital College of Medicine, Louisville, Ky., 1892; member of the Illinois State Medical Society; aged 75; died, October 26, of heart disease.

Isaac J. H. Dunaway, Morehouse, Mo.; Rush Medical College, Chicago, 1896; formerly secretary of the board of health of West Lebanon, Ind.; aged 63; died, October 16.

John F. McGarvey ● Lorain, Ohio; Jefferson Medical College of Philadelphia, 1883; on the staff of St. Joseph's Hospital; aged 76; died, November 6, of coronary thrombosis.

Henry Curt Merten, Union City, N. J.; Medizinische Fakultät der Friedrich-Wilhelms-Universität, Berlin, Prussia, 1887; aged 68; died suddenly, October 21, of heart disease.

Robert A. Ferguson, Bellair, Ill.; Indiana Medical College, Indianapolis, 1878; member of the Illinois State Medical Society; Civil War veteran; aged 90; died, October 21.

William Herschel Knap, Swarthmore, Pa.; College of Physicians and Surgeons of Chicago, 1886; aged 73; died, November 7, in Upper Darby, of bronchopneumonia.

Fred Drew, Boston; Harvard University Medical School, Boston, 1894; member of the Massachusetts Medical Society; aged 67; died, October 22, of cardiovascular disease.

John Powell Hinckley, Fillmore, Calif.; University of Vermont College of Medicine, Burlington, 1875; aged 79; died, August 29, in Hueneme, of valvular heart disease.

Mary A. Hoehn, Cincinnati; Woman's Medical College of Cincinnati, 1894; aged 78; died, November 1, of cardiorenal vascular sclerosis and auricular fibrillation.

John W. Eckfeldt ● Brookline, Pa.; University of Pennsylvania School of Medicine, Philadelphia, 1872; aged 82; died, October 5, of chronic interstitial nephritis.

John A. Walker, Helen, W. Va.; University of Louisville (Ky.) School of Medicine, 1892; aged 63; died, September 21, in a hospital at Beckley, of pneumonia.

Frank Bartlett Miner, Seneca Falls, N. Y.; Long Island College Hospital, Brooklyn, 1892; aged 69; died, October 29, in Glens Falls, of cerebral hemorrhage.

Paul Sanford, San Jose, Calif.; Kentucky School of Medicine, Louisville, 1891; member of the California Medical Association; aged 74; died, September 29.

John Bird Easterly, Istrouma, La.; Kentucky School of Medicine, Louisville, 1893; aged 65; died, October 21, in the Baton Rouge (La.) General Hospital.

James Robert Davis, Noble, Mo.; Barnes Medical College, St. Louis, 1905; member of the Missouri State Medical Association; aged 77; died, September 7.

James H. Kennedy, Aberdeen, Md.; College of Physicians and Surgeons, Baltimore, 1874; aged 85; died, October 26, of arteriosclerosis and acute prostatitis.

Charles A. Rife ● Kyger, Ohio; Starling Medical College, Columbus, 1882; aged 74; died, October 29, in the Holzer Hospital, Gallipolis, of carcinoma.

William C. Rebhan ● Springfield, Ore.; Willamette University Medical Department, Salem, 1907; aged 49; died, September 19, of coronary occlusion.

Anna Jeanette Erskine, Steubenville, Ohio; Cleveland University of Medicine and Surgery, 1894; aged 74; died, October 31, of cerebral hemorrhage.

Ralph Lee Alexander ● Ontario, Calif.; University Medical College of Kansas City, Mo., 1903; aged 57; died, October 19, of a self-inflicted bullet wound.

William W. Hetzler, Germantown, Ohio; Medical College of Ohio, Cincinnati, 1884; aged 82; died, November 8, of cardiovascular renal disease.

Thomas A. Boothe, Cleveland, Texas (licensed, Texas, under the Act of 1907); formerly postmaster of Cleveland; aged 76; died, October 12.

Sidney Beall Clark, Long Beach, Calif.; College of Physicians and Surgeons of Chicago, 1895; aged 63; died, August 25, of cerebral hemorrhage.

William Henry Howitt, Toronto, Ont., Canada; McGill University Faculty of Medicine, Montreal, Que., 1870; aged 89; died, October 20.

Henry John Becker ● Sterling, Colo.; St. Louis College of Physicians and Surgeons, 1920; aged 44; died, September 26, of portal thrombosis.

Addison Fordyce, San Diego, Calif.; Columbia University College of Physicians and Surgeons, New York, 1924; aged 38; died, August 25.

Edwin A. Steely, Anna, Ohio; Medical College of Ohio, Cincinnati, 1873; also a druggist; aged 82; died, October 2, of enterocolitis.

Oliver S. Bell, Detroit; Detroit College of Medicine, 1892; also a pharmacist; aged 64; died, November 7, of cardiovascular renal disease.

Frank M. Faries, Paris, Ky.; Pulte Medical College, Cincinnati, 1885; health officer; aged 72; died, November 4, of heart disease.

Aloysius J. McKinnon, Rio Vista, Calif.; University of California Medical School, San Francisco, 1903; aged 63; died, September 1.

Louis Antonio Cribari, San Jose, Calif.; College of Physicians and Surgeons, Los Angeles, 1920; aged 41; died, August 18.

George Perry Dunham, Mystic, Conn.; Boston University School of Medicine, 1891; aged 69; died, July 5, of coronary thrombosis.

William Washington Ashley, Newhall, Calif.; University of Missouri School of Medicine, Columbia, 1875; aged 79; died, August 8.

William Ernst Kramer, Milwaukee; Rush Medical College, Chicago, 1891; aged 69; died, October 27, of carcinoma of the rectum.

Amos C. Knestrick, Wooster, Ohio; Long Island College Hospital, Brooklyn, 1887; aged 82; died, September 24, of senility.

George H. Cole, Conneaut, Ohio; Cleveland Medical College, 1892; aged 76; died suddenly, November 2, of heart disease.

Solon Philo Bradley, Lansing, Iowa; Hospital College of Medicine, Louisville, Ky., 1892; aged 68; died, October 2.

Simpson F. Williams, Cordele, Ga.; Physio-Medical Institute, Cincinnati, 1885; aged 81; died, September 28.

W. Lowry Jeffers, Baileyton, Tenn. (licensed, in Tennessee in 1889); aged 73; died, October 5, of senility.

Carl Johnson ● Los Angeles; Denver College of Medicine, 1891; aged 66; died, September 14.

Bureau of Investigation

THE NICHOLS SANATORIUM

Another Advertising Cancer Concern Using Escharotics

In Savannah, Mo., a small town a few miles north of St. Joseph, there has been for some years an institution known as the Dr. Nichols Sanatorium for Cancer. It was founded by one Perry Nichols. Perry Lewis Nichols held a diploma from the University of the South Medical Department, Sewanee, Tenn., 1901. He died in 1925.

THE JOURNAL has for years received inquiries from both physicians and laymen regarding the concern. To quote a few from the scores of inquiries received this year:

A woman in Kansas City, Mo., wrote:

"I received a letter from friends in Michigan asking me to find out what I could about the Dr. Nichols Cancer Sanatorium in Savannah, Mo. I called the Jackson County Medical Society and they referred me to you. Is it a reputable hospital or just a quack concern?"

A physician in Seattle wrote:

"Will you please give me some information on Dr. Nichols Cancer Sanatorium, located in Savannah, Mo.?

A physician in Indiana asked:

"Please give me the status of the Nichols Sanatorium at Savannah, Mo."

From a town in Kansas came this inquiry:

"One of my patients asked me concerning the status of the cancer hospital at Savannah, Mo. It has been my impression that this place does not rate very high."

A layman in Cincinnati wrote:

"Enclosed is a letter I received from Dr. Nichols Sanatorium, Savannah, Mo. Have also received the book they refer to in their letter. Upon advice of my doctor I am writing you for information as to the credibility of this sanatorium."

A Canadian physician wrote:

"I have today been advised by letter that my sister-in-law living in Vancouver has left for Dr. Nichols Sanatorium, Savannah, Mo., to undergo treatment for cancer of the breast. She has been advised to go there by well-meaning friends because surgery is not employed. Will you kindly advise me regarding this so-called cancer sanatorium?"

The story of how Perry Nichols came to engage in the cancer-cure business when he was a young man was set forth at some length in a two-page newspaper advertisement that Nichols ran in a St. Joseph, Mo., paper in December, 1924. According to the story there given, Nichols in 1895 was selling real estate in Kingsley, Iowa, a short distance from Cherokee, Iowa, where there was an advertising cancer-cure outfit operating (presumably the Seaman Cherokee Sanitarium). A niece of Nichols was working at the Cherokee institution, and Nichols, when visiting the niece, met the men who were running the cancer concern. They, for some reason not clear—unless it was that Nichols was what is known as a high-pressure salesman whose capacity in this field could be used—invited him to become a partner in the Cherokee institution. He accepted the offer and, with the two men connected with the Cherokee Sanatorium, opened a similar outfit in Des Moines, Iowa. According to Nichols' story, they treated one patient—unsuccessfully—and then the partnership was dissolved. This was in June, 1896.

In November, 1896, Nichols started in the "cancer cure" business on his own responsibility, although he had no medical education. He treated patients who had, or thought they had, cancer, keeping within the law by engaging a licensed practitioner to assist him. Later Nichols obtained a medical diploma from a low-grade (Class C) institution that went out of existence in 1909. He first began practicing medicine at Watertown, S. D., with cancer-curing as a side-line. Within eighteen months he moved to Sioux Falls, S. D., and later to Hot Springs in the same state, where he started his first cancer cure "sanatorium." He conducted this for some years, in the meantime opening a branch sanatorium at Excelsior Springs, Mo. But Excelsior Springs would have none of him and passed an ordinance that resulted in Nichols' leaving that town. He continued to operate his Hot Springs institution until 1914, when he decided that he would get a little nearer the center of population and went to Savannah, Mo.

The Nichols concern, of course, uses the escharotic treatment. According to the statement that has been made for many years, both before Nichols died and since, this has been vaguely described as:

" . . . a double compound, about four times the strength of chloride of zinc plaster, or the arsenical or Marsden's paste, and acts with decidedly less pain."

The claim is further made that the escharotic they use "is not poisonous." This contradicts the information furnished us by the Reverend Mr. W——, a Presbyterian minister who had also been a professor of biology. This gentleman's wife was induced to go to the Nichols Sanatorium. In a letter that Mr. W—— wrote to the American Medical Association, he thus described the situation:

> "I was present at the Nichols Sanatorium the day Mrs. W—— was examined. A woman nurse who is now Superintendent of the institution since Dr. Nichols died examined my wife. The examination was concluded in less than ten minutes. The nurse felt of Mrs. W——'s breast (there was no sore), also felt under her arm, and said, 'The cancer extends under arm—serious case.' Mrs. W—— was assigned a room and the next morning was put under the influence of drugs while the arsenic poison was applied to burn out the supposed cancer . . .
>
> "No effort was made at Dr. Nichols Sanatorium for Cancer to find out definitely if Mrs. W—— had cancer before administering treatment of arsenic poison in poultice form.
>
> "For nearly ten days Mrs. W—— was constantly under the influence of drugs. Then hurried out of Sanatorium three weeks from the day she entered to make room for other dupes and victims of this alleged 'Cancer Cure.'
>
> "Since Mrs. W—— left Nichols Sanatorium she has had a nurse and doctors—several nurses and several doctors. The arsenic poison has so filled her system and destroyed her vitality that she is now dying."

Nichols' institution seems to be conducted by a woman who was associated with Nichols for many years, as "Superintendent" and "Director of Treatments." In 1932 the Nichols concern listed as its "Medical Director" and "Plastic Surgeon" W. A. Stearns, M.D., with E. S. Metheny, M.D., as "Assistant."

In 1924, a year before Nichols died, prospectuses were sent out advertising "First Mortgage Serial Coupon Gold Bonds" issued by the Dr. Nichols Sanatorium Corporation. These were to pay 7 per cent interest, payable semi-annually, and to mature in 1927, 1929 and 1931, respectively. The prospectus gave the amount of cash that Nichols had allegedly taken in annually from the time he started in 1905 up to and including 1923. In 1905 his cash receipts were $3,300; in 1923 these had risen to $201,600, with net profits amounting to $71,720 after all expenses had been paid. The business has evidently been a profitable one.

The Nichols concern has for years issued elaborate and expensively prepared booklets, printed on deckle-edged paper, with numerous illustrations both in color and monotone. A large part of the book lists, according to states, the names and addresses of "cured patients." A few years ago the Bureau of Investigation, with the aid of the physicians of a county in Missouri, undertook to investigate all of the cases of patients whose names were given as coming from that county. Fifty-five cases were looked into. Investigation disclosed that forty-seven of the fifty-five patients were still living; eight were evidently actual cancer cases, for the patients were dead. Of the fifty-five patients, forty-three had had the diagnosis of cancer made, not by independent physicians, but by the Nichols concern itself! Three of the patients had their cases diagnosed as cancer by physicians, but no microscopic examination had been made, the diagnoses being of a clinical character only. In a few of the other cases detailed information could not be obtained.

In some of the older advertising one Jack Nichols was listed as being connected in some way with the Sanatorium. Although his picture has been published, it is not at all clear just what place Jack Nichols has in the scheme of things at the Nichols Sanatorium. In July, 1931, the American Medical Association received a letter reading as follows:

"*Gentlemen*:—As a member of the Dr. Nichols Sanatorium Incorporated, and thru long association with this concern, I have acquired a knowledge of what I believe constitutes a violation of the good practice of medicine.

If I can satisfy you as to the fact of this violation and will give you my full support, what may I expect from you by way of rectification in the same?

Sincerely yours,
Jack Nichols.

Mr. Nichols' letter was answered as follows:

"We should say that it would not be necessary to have any long association with the concern mentioned in your letter to be convinced that there had been 'a violation of the good practice of medicine.' We have been convinced of the same thing for very many years."

The Medicolegal Department of THE JOURNAL for October 7, this year, abstracted a legal case involving malpractice in which the Nichols Sanatorium was the defendant [*Gates v. Dr. Nichols' Sanatorium (Mo.), 55 S. W. (2d) 424*]. The plaintiff was one of the Nichols Sanatorium's victims, a woman who had gone to Savannah to be treated for two "lumps" in her right breast and one in the right axilla. A nurse diagnosed (!) her case as cancer and applied an escharotic mixture said to contain antimony and zinc chloride. As the escharotic began getting in its work, the nurse removed the necrotic tissue with surgical scissors and a curet. The entire right breast and a large part of the flesh in the axilla were thus removed before the victim left the Sanatorium. Fourteen months later she returned for treatment for another "lump" in the right axilla. The second course of treatment left her right arm useless. In the healing process the flesh united her arm to the side of her body. When she attempted to move her arm, the scars cracked and bled. She then went to a reputable physician, who performed a Wolf graft, which greatly improved her condition.

The woman sued the Nichols Sanatorium, alleging negligence and unskillfulness, and the jury returned a verdict in her favor. For some reason not clear, the judge overruled the jury's verdict and ordered a new trial, and the Kansas City court of appeals

affirmed the order of the trial court. The victim then appealed to the Supreme Court of Missouri. This, the highest court in the state, in its opinion declared that there was ample testimony to support the allegations of the woman that the Nichols Sanatorium was negligent; that the Sanatorium had discharged the woman in a condition that rendered her practically an invalid for the remainder of her life, and it was a condition that could have been prevented or remedied. The Supreme Court also declared that the testimony showed that the Nichols concern used a method of treatment that has been condemned by the medical profession.

In the trial of the case in the lower court, the Nichols concern undertook to introduce the testimony of one of its nurses to show that no more flesh was removed than was necessary to cure the diseased condition. The judge in the trial court ruled that while the Nichols Sanatorium might show what was done, it could not introduce as evidence the opinion of the nurse, because, according to the judge, that opinion was a mere conclusion and would invade the province of the jury. The Supreme Court, much more rationally, took the position regarding this ruling that the nurse's testimony was properly excluded, not because it would invade the province of the jury, but because the nurse was not competent to testify. The judgment of the trial court awarding a new trial was reversed and instructions were issued to reinstate the verdict of the jury and enter judgment against the Nichols Sanatorium for the victim.

The various institutions of dubious scientific standing that advertise to cure cancer, use, in practically every instance, caustics or escharotics. Many persons, especially those past middle age, who develop benign growths, assume that such growths are cancer and on their own responsibility go to these cancer-cure institutions that advertise that they do not use the knife. There the patient is told that the condition is cancerous; the growth is eaten out with caustics, the wound heals, and the patient goes back to his home a living advertisement for the "cure" of a "cancer" that never existed.

Correspondence

AMEBIC DYSENTERY

To the Editor:—It is not without grim humor that California medical men join their colleagues of the Southern states in observing the dramatization by Chicago health authorities of an outbreak of amebiasis recently recognized in that city. The 1927 Chicago survey (Kaplan, Bertha; Williamson, C. D., and Geiger, J. C.: Amebic Dysentery in Chicago, THE JOURNAL, March 26, 1927, p. 977) was of practical significance but the recommendations of this initial report obviously were not followed up. However, the present health authorities are to be congratulated on continuing this work and realizing its importance. Generally considered a "tropical disease," physicians in most of the United States have consistently refused to admit its potential menace as revealed by the extraordinarily high incidence of "carriers" without obvious symptoms (who have tissue damage, nevertheless) along with active cases found on systematic surveys of average populations in California and the South (Kofoid, A. C.: Twenty-Ninth Bienniel Report, California State Bd. of Health, 1926, p. 93: 13.1 per cent in 6,834 persons. Kessel, J. F., and Mason, V. R., Protozoan Infection of the Human Bowel, THE JOURNAL, Jan. 4, 1930, p. 1: 9.8 per cent in 2,731 persons. Craig, C. F.: The Amebiasis Problem, ibid., May 7, 1932, p. 1615. Johnstone, H. G.; David, N. A., and Reed, A. C.: A Protozoal Survey of One Thousand Prisoners, ibid., March 11, 1933, p. 728: 9.6 per cent in 1,000 persons). Current interest may focus public health attention on the problem with beneficial result, as implied by Dr. Bundesen and his associates (THE JOURNAL, November 18, pp. 1636 and 1638). Amebiasis, of course, should be reportable to health authorities.

The purpose of this communication, however, is to comment on the discussion of treatment of amebiasis as outlined in a review compiled from textbooks (THE JOURNAL, November 18, p. 1639). The review mentioned may give support to dangerous or inadequate therapy.

The only comprehensive disinterested critical survey of the treatment of amebiasis reported so far has been made cooperatively by the Pacific Institute of Tropical Medicine within the Hooper Foundation for Medical Research and the Pharmacological Laboratory of the University of California Medical School in San Francisco. The general results of this survey have been published in part (Leake, C. D.: The Chemotherapy of Amebiasis, THE JOURNAL, Jan. 16, 1932, p. 195) and detailed special studies have also appeared. Referring to one of these (David, N. A.; Johnstone, H. G.; Reed, A. C., and Leake, C. D.: The Treatment of Amebiasis with Iodochlorhydroxyquinoline [Vioform N. N. R.], THE JOURNAL, May 27, 1933, p. 1658), the review states, "In their report they believe that Vioform is the most efficient drug of any type used in amebiasis." The only statement made by David et al. which could possibly be misinterpreted in such an unfortunate manner is the clearly phrased observation "In monkeys naturally infested with Endamoeba histolytica, iodochlorhydroxyquinoline was found to be more effective in nontoxic doses in completely and permanently clearing the stools than any mode of treatment yet reported on."

[NOTE.—This quotation is in error. THE JOURNAL quoted David, N. A.; Reed, A. C., and Leake, C. D.: The Treatment of Amebiasis with Iodochloroxyquinoline, *J. Pharmacol. & Exper. Therap.* **48**:271 (July) 1933.—ED.]

Most of the treatment discussion in the review is quoted from Dr. C. F. Craig (in Musser's Practice of Medicine, 1932, p. 241). The review states, "In the chronic cases Craig recommends continuous treatment with emetine bismuth iodide or chiniofon."

Continuous administration of any emetine preparation is very dangerous. Emetine and its derivatives may be lethal for mammals, including man, in a total dosage of from 10 to 25 mg. per kilogram, regardless of the method of administration. Toxicity studies indicate that it is very slowly excreted or detoxified, so that cumulative poisoning may readily occur on repeated use (Anderson, H. H., and Leake, C. D.: *Amer. J. Trop. Med.* **10**:249 [July] 1930). Heart Muscle bears the burden of the toxic effect of emetine, as shown experimentally and clinically (Rinehart, J. F., and Anderson, H. H.: Effect of Emetine on Cardiac Muscle, *Arch. Path.* **11**:546 [April] 1931). It is unfortunate that the review failed to point out the total amount of emetine that may be safely given without injury to the patient. In 1914 Vedder stated that a total of 10 grains (0.65 Gm.) should not be exceeded in the average human adult (THE JOURNAL, Feb. 14, 1914, p. 501). Later studies have confirmed this opinion with the recommendation that if emetine is used at all its dosage should be based on body weight and not exceed 1 mg. per kilogram for a single dose or a total dosage of 10 mg. per kilogram (Anderson and Leake).

Chiniofon (exploited under the trade names of "Anayodin" and "Yatren"), which is discussed in the review, is iodohydroxyquinoline. In the only comparative study reported on this drug, it was shown to be the least effective in comparison with ten other related halogenated oxyquinolines. Of this clinical group of drugs, iodochlorhydroxyquinoline (vioform N. N. R.) was found to be best suited for clinical use. This drug, however, should not be employed rectally because of possible local irritation.

Two organic arsenical drugs are mentioned in the review, acetarsone ("stovarsol") and carbarsone. The former is far more toxic in effective dosage than the latter, but this important information does not appear in the review. Toxic reactions with acetarsone may be expected in about 15 per cent of patients treated at the dosage recommended, and many cases of poisoning with it have been published (Bender, W. L.: *Am. J. M. Sc.* **176**:819 [Dec.] 1927. Michael, J. C.: Exfoliative Dermatitis from Acetarsone, THE JOURNAL, Feb. 23, 1929, p. 645). Before the recent meeting of the American Society for Tropical Medicine, Anderson and Reed reported 330 cases of amebiasis treated with carbarsone, with 90 per cent success and only one mild untoward reaction in a patient with hepatitis. No other toxic effect from carbarsone has yet appeared. Chopra, Sen, and Sen of Calcutta *(Indian M. Gaz.* **68**:315, 1933) have shown that carbarsone is definitely more effective in amebiasis than emetine bismuth iodide or kurchi alkaloids. Presson (*Am. J. Trop. Med.*, to be published) has also confirmed the clinical value of carbarsone, in agreement with Anderson (*Am. J. Trop. Med.* **12**:459 [Nov.] 1932) and with David, Johnstone and Stanley *(Am. J. M. Sc.* **184**:716 [Nov.] 1932), and also with the initial clinical report of Reed and his associates (THE JOURNAL, Jan. 16, 1932, p. 189). Carbarsone has an advantage in being susceptible of satisfactory rectal administration (Anderson, H. H., and Reed, A. C.: *Am. J. Trop. Med.*, to be published) in acute amebic dysentery. Carbarsone is certainly a highly effective drug in amebiasis, and because of its low toxicity on repeated dosage (Dr. J. C. P. Fearrington of Lincoln, Neb., used a total dosage as high as 1,200 mg. per kilogram over forty-eight weeks in thirty syphilitic patients with no sign of toxicity), and also because of its definite "tonic" action, it is clearly to be recommended in chronic amebiasis except when there is demonstrable liver injury. Here arsenic is contraindicated. Emetine remains the drug of choice in amebic hepatitis or liver abscess.

Failure of recurrence of amebas in the stools of patients successfully treated with carbarsone or with vioform and maintained under proper controlled conditions eliminating danger of reinfection has been demonstrated in a sixteen months follow-up period by Reed and Johnstone (*Am. J. Trop. Med.*, to be published). Danger from reinfection is thus shown to be a more serious concern for the physician than possibility of relapse after successful treatment. Unless the patient's environment is controlled, especially with regard to food handlers in his household, reinfection is a constant menace even in the face of adequate treatment.

The review does not mention the usefulness of bismuth subcarbonate in massive doses in controlling acute amebic dysentery, as emphasized by James and Deeks (*Am. J. Trop. Med.* **5**:97 [March] 1925).

The review quite properly stresses Craig's criteria of cure as based on repeated stool examination. On the other hand, it unduly emphasizes the necessity of confinement to bed during treatment. While this may be indicated in patients weakened by emetine therapy, it is not necessary in the majority of cases when less toxic and more effective agents, such as carbarsone or vioform, are employed.

Empirical clinical observation has led to the use of many different types of drugs in amebiasis. The only systematic critical study of their relative values that has yet appeared has clearly indicated that (1) kurchi and ipecac (emetine) alkaloids are unsatisfactory, since the former are too inactive and the latter too dangerous in doses necessary for effectiveness; (2) among many miscellaneous astringent and antiseptic agents, bismuth subcarbonate is the only one proposed that deserves any attention at present; (3) much more efficient halogenated oxyquinolines are available than chiniofon ("Yatren" or "Anayodin"), vioform being proved to be so on clinical trial, and (4) much less toxic and more effective organic arsenicals are available than acetarsone ("stovarsol"), notably carbarsone, which on extensive independent clinical study has been found to give more satisfactory results with less untoward reaction than any amebacide now in use.

J. C. GEIGER, M.D.,
K. F. MEYER, PH.D.,
E. L. WALKER, SC.D.,
A. C. REED, M.D.,
H. H. ANDERSON, M.D.,
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San Francisco.

To the Editor:—I wish to congratulate you on the excellence of the articles and the editorial on amebic dysentery that appeared in THE JOURNAL, November 18. Although it is regrettable that an epidemic of amebic dysentery should have started in connection with the Century of Progress Exposition, perhaps no better method of emphasizing the importance of this condition in the country as a whole could have been found. The wide publicity given to this epidemic will undoubtedly lead to the discovery of many cases of amebiasis throughout the country and a better understanding of the disease.

I think it is particularly important to emphasize, as a supplementary point in the diagnosis of amebiasis, that, in addition to Endamoeba histolytica, man is known to harbor in his intestine at least four other amebas, none of which are pathogenic. It is just as important to be able to differentiate these amebas from Endamoeba histolytica as it is to be able to identify the pathogenic ameba itself. Whenever a supposedly unusual disease is called to the attention of the medical profession, many cases of other diseases are likely to be reported as the disease in question because of difficulties in diagnosis. The diagnosis of amebiasis should not be left to technicians who are not familiar with all the intestinal amebas. Authorities agree that it requires several months' training for a technician to become accurate in the identification of these parasites. One of the great needs at the present time is the better training of technicians along

this line. A good general rule for the ordinary laboratory in the identification of the motile form of Endamoeba histolytica is that no ameba should be so identified unless it is actively motile and contains red blood cells. In the identification of cysts there is also danger of interpreting cysts of Endolimax nana and four-nucleate cysts of Endamoeba coli as Endamoeba histolytica. In the presence of a simple diarrhea or following the administration of a cathartic, motile amebas of any of the five human species may be found in the stools, and caution should be urged in interpreting amebas discovered under such conditions as Endamoeba histolytica, even by the best of technicians, unless active motility and the inclusion of red blood cells verify the diagnosis, or unless they can be checked by fixed smears stained with iron-hematoxylin. In a disease such as amebiasis, in which a permanent cure is difficult to obtain and in which specific treatment may prove toxic to the patient, accurate diagnosis is much to be desired.

HENRY E. MELENEY, M.D., Nashville, Tenn.

To the Editor:—In THE JOURNAL, November 18, attention was called to the present widespread dissemination of amebiasis. These reports will unquestionably stimulate a careful search for Endamoeba histolytica and, where it is found, call for treatment. Emetine, no doubt, will be one of the drugs used. Attention is drawn to an article I published in the *American Journal of the Medical Sciences* (**179**:834 [June] 1930) in which I reported a case of fatal emetine poisoning due to cumulative action. The dose had been considered considerably less than the established minimal lethal dose. The conclusions I reached after a comprehensive survey of the literature were as follows:

1. There is no established method of administration of emetine that can be accepted with impunity. The drug, being a protoplasmic poison, acts on the host as well as on the parasite.

2. Conclusions drawn from laboratory animals, owing to differences of species and of individual susceptibility, cannot be applied to man to determine the minimal lethal dose of emetine.

3. The minimal lethal dose of emetine may be passed without the advent of sufficiently severe symptoms of emetine poisoning, and death may occur from cumulative action, after its administration has been discontinued.

4. Individual susceptibility to emetine cannot be recognized in advance, and each patient must be considered as possibly susceptible, to prevent the occasionally fatal case of emetine poisoning.

5. Emetine in very small doses, with frequent and sufficiently long rest periods, will be amebacidal. If the infection does not clear up on this basis, the amebas are of an emetine-resistant strain and other forms of treatment must be devised.

6. Present knowledge of the action of emetine on the human system is but poorly understood, nor is its action on amebas definitely known.

7. There is no antidote for emetine poisoning.

FRANK J. LEIBLY, M.D., Seattle.

To the Editor.—I have read with a great deal of interest the excellent reports of the epidemic of amebic dysentery in Chicago and the reviews of the general subject published recently (November 18) in THE JOURNAL. There is one point concerning the epidemiology and control of this disease which appears to have been overlooked or inadequately understood. Because of its importance from a practical standpoint, I venture to bring it to your attention in the hope that you may see fit to give it the timely publicity it deserves.

The dysentery-producing ameba has a high multiple incidence in families or households. That fact was stressed by Kofoid, in 1923 (*Univ. California Chron.* **25**:302 [July] 1923) and 1923 (Proceedings of the International Conference on Health Problems in Tropical America, 1924, p. 322), and more recently by Meleney in 1930 (*J. Parasitology* **16**:146 [March] 1930). In my report (*Am. J. Hyg.*, to be published) of an amebic survey of the residents of a small mining community in Mexico, it is pointed out that a considerable proportion of the cases of amebic infection occurred in households in which from two to four members were infected.

We have under observation at present in Baltimore a family that, in March, 1932, comprised a father, mother and eight children. Both parents and seven of the eight children carried Endamoeba histolytica, usually in association with four other species of intestinal protozoa. In another family, composed of father, mother and two sons, we have found the dysentery-producing ameba in both parents and one of the boys. The probability is, as Meleney has pointed out, that the infected mother, who in these families is the principal food handler, is the source of the infection for other members.

The implications of high multiple household amebic incidence as they relate to the epidemic extending from Chicago are (1) that not only public food handlers should be examined but the families of positive food handlers should also be examined and, if found positive, treated, and (2) that in all cases of amebiasis, the other members of the household should be promptly examined and, if found positive, treated. From the standpoint of prevention of this disease, little is accomplished by the successful eradication of the parasites in individuals, either for the affected persons or for the community if the danger of reinfection from other members of the family group is not guarded against. In my opinion many of the recurrences reported following apparently adequate amebicidal treatment are due to reinfections from intrafamilial sources rather than to relapses, as is commonly inferred.

Unless attempts at amebic control focus on the family rather than on the individual much of the effort that will undoubtedly be stimulated by the recent publications in THE JOURNAL will have been in vain.

JUSTIN ANDREWS.
Assistant Professor, Department of Protozoology,
Johns Hopkins University.

To the Editor:—In view of the widespread epidemic of amebic dysentery that seems to be imminent, may I take the liberty of offering some corrections of your suggested emetine regimen in the amebic dysentery review that appeared in THE JOURNAL, November 18? Nowadays, since the reporting of quite a number of cases of severe emetine poisoning, the combined employment of emetine hydrochloride by injection and emetine bismuth iodide by mouth is no longer considered safe for routine therapy. Instead, emetine bismuth iodide is omitted and the hydrochloride is employed about as follows: one injection daily (1 grain for the adult, ½ grain for children of eight, ⅙ grain for younger children) for six days, and then one injection of just half these doses daily for the next six days. The adult will then have received 9 grains, which is close to 10 grains (0.65 Gm.), which has come to be considered the safe amount to be administered in one course. During the rest period of ten days or more, other drugs may be given; then the injections may be repeated, or emetine bismuth iodide (which contains 20 per cent emetine) may be given in 1 grain dose (adult) three times daily for ten days.

The warning against intramuscular injection is perhaps unfortunate, since subcutaneous injection of the hydrochloride is sometimes followed by pain, discoloration of the skin and even slough; deep injection into the gluteal region is therefore considered the method of choice, though it is painful also.

I may add that many physicians with abundant experience in the disease are now preferring to use Acetarsone, N. N. R. (stovarsol), the adult dose of which is 4 grains three times daily, and emetine hydrochloride on alternate days for two weeks. One of our faculty members who was unfortunately infected in Chicago (the *first* one at least!) is now being satisfactorily treated in this way.

HARRY BECKMAN, M.D., Milwaukee.
Director, Department of Pharmacology, Marquette University School of Medicine.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

TREATMENT OF RINGWORM OF THE SCALP

To the Editor:—Is there any known drug capable of penetrating the hair shaft in sufficient strength to destroy the fungus in ringworm of the hairy region and is croton oil a reliable method?

H. H. RITTENHOUSE, M.D., Bridgeville, Pa.

ANSWER.—By the criterion given, tincture of iodine should be the best remedy, for it ranks high as a fungicide and penetrates the skin better than any other drug in this class; but this argument carries little weight, for the chief benefit from these drugs seems to be the inflammatory reaction caused by them, which results in immunity to the organism. The antiseptic action of the drug is useful chiefly in preventing the spread of the infection to others, and the depth of penetration is of value chiefly because of increased irritation. For this reason it is a fact, though it seems paradoxical, that deep ringworm infections like kerion of the scalp or beard are more easily cured than the common superficial microsporon infection of the scalp in children, which remains comparatively noninflammatory.

It is assumed that the question refers to ringworm of the scalp in a child. Some cases, particularly those in infants or very young children, can be cured by the persistent use of mild remedies, such as ointment of ammoniated mercury, from 5 to 10 per cent, applied once or twice a day for several weeks. In older children, sodium thiosulphate solution, 14 per cent in water, can be rubbed vigorously into the affected areas twice a day until irritation results, when soothing applications, such as 10 per cent boric petrolatum, are to be applied until the irritation subsides, and then the same treatment is repeated. If a stronger method is desired, the same thiosulphate solution may be followed by a 3 per cent solution of tartaric acid, releasing sulphur and sulphurous acid. Strong measures are to be restricted to small areas of the scalp and not used for children less than 7 years old. Tincture of iodine may be painted repeatedly on an area an inch or less in diameter until a black crust forms. This should be torn off, to carry with it many diseased hairs. A soothing preparation is then to be applied until irritation subsides. Still more reaction can be obtained by alternating tincture of iodine and ointment of ammoniated mercury, causing an active dermatitis. Many other drugs and methods of this kind were in use before the epilating power of the x-rays was discovered.

Croton oil is the most severe chemical used for this purpose. It should not be used for young children, and if used should not be applied to an area more than half an inch in diameter. It may be introduced into the hair follicles with a hypodermic needle in the smallest possible amount. Within twenty-four hours pustulation results and the hairs can be removed. Soothing ointment should then be applied. This treatment causes follicular scarring and the hair does not grow again. It should therefore be used only when the bald spot can be concealed.

A milder method of using croton oil is its application in 10 per cent strength in olive oil, rubbing it into a small area and waiting for an inflammatory reaction. This may be strong enough to cure the infection without destroying the hair. If too little irritation results from a 10 per cent solution, it may be used in greater strength.

Mechanical epilation is highly recommended by authors of the prereontgen era, but it is tedious and a difficult job. Only a small area can be epilated at one sitting and it is sometimes impossible to remove the diseased hairs, because they break easily. Shaving or chemical epilation were also used. Epilation by x-rays is a much more satisfactory prelude to treatment; but the treatment following it must never be irritating. It is limited to the application of mild antiseptics like tincture of iodine and is stopped when the skin begins to show too much drying.

With any method, frequent scrubbing with soap and water is indicated and the hair of the whole head should be kept clipped short to allow inspection and the detection of newly infected spots. This should be kept up for several months after apparent cure of any case of ringworm of the scalp. The English dermatologist Crocker said of the treatment of ringworm of the scalp: "I know of only one certain remedy; namely, persistence."

PARESTHESIAS

To the Editor:—I have a patient about 40 years of age who complains of various paresthesias with a creeping sensation in the face, sand in the shoes, tickling sensation on top of the ear, and burning in the tip of the tongue. He also has some numbness and tingling in the hands and feet, slight dizziness at times, and floating spots before the eyes. When he stands and looks at a still object, such as a building, it appears to move slightly. He appears healthy and weighs 215 pounds (97.5 Kg.). The pupils are equal and react to light and in accommodation. The eyes rotate normally. The reflexes are normal except that the knee jerk is not pronounced. The Romberg sign is negative. There is no astereognosis. Sensation is intact for cotton, pain and heat. The blood pressure is 125 systolic, 80 diastolic. The urine is negative for albumin or sugar. The red blood cells number 6,160,000, with 90 per cent hemoglobin (he had come from a high altitude). There is no history of venereal disease, but the Wassermann reaction is negative to alcoholic antigen and very slightly positive to cholesterolized antigen. The Kahn reaction is negative. What suggestion do you have as to diagnosis? Could the Wassermann reaction be disregarded? Two Wassermann tests were taken six months apart with an identical reaction. Kindly omit name and address.

M.D., Iowa.

ANSWER.—The only objective finding recorded in this case is the alteration in the blood count. This may, as suggested, be the result of a high altitude. In view of the paresthesias, however, for which no other explanation has been found, it would be wise to bear in mind the possibility of a blood-forming disorder. The very slight reaction with a cholesterolized antigen can probably be disregarded. A psychiatric examination for the possible presence of a functional disorder is also indicated. No diagnosis is possible from the facts stated.

POSTOPERATIVE CARE IN TONSILLECTOMY

To the Editor:—I should like to know the best preparations to use in the tonsillar fossae following a tonsillectomy to prevent hemorrhage and inflammation. What is the best preparation to use beforehand to prevent postoperative inflammation? Please omit name.

M.D., Indiana.

ANSWER.—Tonsillectomy is an unsatisfactory operation in a number of respects. Unlike the peritoneal cavity, wherein the surgeon makes every attempt to cover raw surfaces, tonsillectomy permits a large, raw wound to heal, in the presence of the normally infected secretions of the mouth and subjected to the trauma of swallowing. Hemorrhage that occurs at the time of operation or within a few hours should be considered primary. The best protection against hemorrhage of this nature, on the assumption that the patient is suffering from no blood dyscrasia, is to use the principles followed elsewhere in surgery. Every bleeding vessel, vein or artery that does not spontaneously cease bleeding after a reasonable wait and following the use of sponge pressure should be seized and ligated. Oozing that is of no significance may be stopped completely by application of a mud made by soaking tannic acid in epinephrine, 1 to 1,000. Having the patient breathe through the mouth, and small pieces of ice dissolved on the tongue, coupled with small doses of morphine for sedation, are also recommended as helpful in preventing bleeding shortly after operation.

A certain amount of reaction or inflammation follows every tonsillectomy. The best safeguard against reaction and hemorrhage, incidentally, is to do the operation with as little trauma as possible. As the healing of the raw surface takes place, first of all by the formation of a slough and then of granulation tissue and ultimate epithelization, from time to time so-called secondary bleeding may occur from approximately the fifth to the fourteenth day. Most of these hemorrhages can be stopped by sponge pressure or by the application of tannic acid in epinephrine; but occasionally one or more sutures are necessary to control the bleeding. There is no known way of preventing secondary hemorrhage, apart possibly from a careful choice of the time chosen for operation, and the physician should wait from ten days to two weeks following a sore throat before

attempting removal of the tonsils. Of course the patient's general condition should be as good as it is possible to make it and for four or five days following operation there should be no marked exertion. Gargles and local applications are of little avail in the hands of most men in reducing the painful and other distressing reactions following this operation.

ERYTHROL TETRANITRATE AND POTASSIUM THIOCYANATE IN HYPERTENSION

To the Editor:—I should appreciate some information on the following: 1. Are there any harmful or undesirable effects from prolonged administration of erythrol tetranitrate drug in doses of 1 grain (0.065 Gm.) three times daily in case of "essential" hypertension? 2. What is the value, if any, of potassium sulphocyanate in hypertension? What is its dosage and method of administration? Please omit name.

M.D., Massachusetts.

ANSWER.—1. If the dose is chosen too high, there is a dilatation of the blood vessels of the head with a feeling of heat and discomfort, even throbbing headache. The pulse becomes softer and more rapid. There may be general irritability. Often a dose of 0.03 Gm. is tolerated without distress, when the larger dose produces disagreeable side effects.

2. Potassium thiocyanate, in doses of from 0.1 to 0.3 Gm. three times daily, is capable of temporarily reducing blood pressure with improvement in symptoms in possibly one third to two thirds of cases. If the blood pressure reduction is excessive, untoward symptoms may occur, such as weakness, dizziness and drowsiness, which disappear when the drug is discontinued or its dosage is reduced. There seems to be a tendency to cumulative action, which may be prevented by taking blood pressure readings every week or two and possibly by omitting the medicine one day each week. It may be administered in syrupy solution; possibly the syrup of raspberry is as good a vehicle as any.

EFFECTS OF REMOVAL OF KIDNEY

To the Editor:—Will you please tell me what effect the surgical removal of one kidney has on a person? Can he buy life insurance, or what is the average life of a person after removal of one kidney? Thank you for any information you may be able to give me.

M. M. THOMPSON, M.D., Logan, N. M.

ANSWER.—Man can live even after all of one kidney and about half of the other have been removed or destroyed, provided the function of the remaining portion is not impaired. The removal of one kidney therefore should not of itself shorten life. The problem of expectancy of life after nephrectomy depends, of course, on the reasons for which the kidney was removed. If a tuberculous kidney has been removed but the patient's original tuberculous focus remains actively progressive, eventual involvement of the other kidney is, of course, a possibility. If the cause for which nephrectomy was done does not remain as a danger to life, a patient can obtain life insurance, from companies which do not specialize in preferred risks, after a reasonable period of observation has passed to allow of studies to determine that function of the remaining kidney is adequate.

INDUSTRIAL HAZARDS ASSOCIATED WITH BIRCHWOOD

To the Editor:—I have a request for information about a form of dermatitis that affects workers using birch in the wood working industry. Can you send a list of references on the subject? Since it is rather common among the wood workers in the factories of Maine, it seems probable that articles and perhaps pamphlets have been written about this disease.

MARION CODD FULLER, Maine State Library, Augusta, Maine.

ANSWER.—No extensive body of published information on birchwood dermatitis is known to exist.

McCord (Industrial Hygiene for Engineers and Managers, New York, Harper & Brothers, 1931) states: "In addition to mechanical irritation from the dust [birchwood saw dust], it is believed that this wood offers other opportunities for damage. The chemistry of birchwood reveals a rich content of complex carbohydrates. These polysaccharides are probably converted into simple sugars in the process of boiling birch logs. The presence of sugars on skin surfaces, or in the eyes, favors bacterial growth."

In addition, it may be observed that workers with logs or in sawmills are prone to develop fungous infections of the skin and possibly of the lungs. If the logs are subjected to chemical treatment for the extraction of various tars, acids or alcohols, these extracts are to be regarded as skin irritants in some instances.

VARIATIONS IN BLOOD PRESSURE

To the Editor:—In Queries and Minor Notes (THE JOURNAL, July 29) under the title of "Variations in Blood Pressure of Arms and Legs," the statement is made that "no real explanation is given except that the difference in pressure is due to differences in hydrostatic pressure." While this is undoubtedly true in part for the erect subject, it cannot account for the definite difference of from 10 to 40 mm. of mercury in a horizontal subject. Clinical blood pressure readings made with the usual arm cuff and manometer indicate only the air pressure in the cuff when the artery is collapsed. Any increase in thickness or resistance of the structures surrounding the artery will make a higher cuff pressure necessary before the artery can be collapsed. This may easily be demonstrated by taking blood pressure readings before and after wrapping several thicknesses of towel round the upper part of the subject's arm. Is not the greater tissue resistance of the leg the chief reason for the higher readings? If this idea is tenable it raises questions of much greater clinical importance which would well bear authoritative discussion: Does the obese patient with a high blood pressure reading really have high blood pressure or is the high reading due to increased tissue resistance? Is the blood pressure really raised in subjects with vascular sclerosis and calcification, or does the hardened vessel wall merely require a greater cuff pressure to produce collapse?

RICHARD B. STOUT, M.D., Elkhart, Ind.

ANSWER.—Another explanation given for the elevated systolic pressure in the horizontal position in patients with aortic regurgitation is that the tonus of the arteries of the lower extremities is increased. This increase must be overcome before the blood enters the dependent parts and is in effect a compensatory mechanism. That such a hypertonus exists is shown by the fact that the application of heat to the leg will lead to a lowering of the systolic pressure. It has been shown that both obesity and the thickening of the blood vessel walls have a negligible effect on the actual blood pressure readings.

STERILITY

To the Editor:—1. A man comes complaining of sterility. On examination of semen within fifteen minutes after ejaculation there is found an abundance of spermatozoa but there is no movement of them whatever. What is the probable cause of such an occurrence? What remedial measures would you suggest to overcome it? 2. A woman patient is anxious for conception. On examination of the husband, spermatozoa are found in abundance and vigorously motile. Roentgen examination reveals the fact that both tubes in the female are patent. What would be your explanation for lack of conception, and what would you suggest as an aid in this direction?

M.D., Montana.

ANSWER.—1. This may be caused by technical errors that kill the spermatozoa through overheating, chilling or exposure to some harmful chemical, by normal spermatozoa being exposed to toxic secretions from an inflamed prostate or seminal vesicles, or by lack of vitality brought on by general constitutional disease, endocrine disturbances or local circulatory abnormalities such as are caused by varicocele. The treatment depends on the diagnosis and will suggest itself as soon as the diagnosis is thoroughly established, though in the nature of the case there are some conditions that are irremediable.

2. Further tests must be made to establish a diagnosis. Of these, the postcoital test is the most important. If it can be established that spermatozoa penetrate in large numbers into the fundus of the uterus and are able to live there, the diagnosis of failure of ovulation can be established. If not, there must be some abnormality of the cervical or uterine secretions, which should receive appropriate treatment. If there is failure of ovulation, the basal metabolic rate should be determined and other evidences of endocrine disturbance searched for. There should also be a thorough physical examination to determine the presence of any organic disease. Finally, there seems to be with certain patients a functional sterility of psychogenic origin.

IODIDE IN CATARACT

To the Editor:—What form of iodide is used in clearing progressive cataract and how should it be administered? Some publication appeared in a journal last year but I am unable to locate it.

P. U. DUCOMMON, M.D., Camden, Ark.

ANSWER.—No form of iodine will clear a progressive cataract. Sodium iodide has been used for many years as an eye wash in 2 per cent solution and internally following the dictum of Dor of Lyons, but no real results have ever been proved. Weeks of New York advocated the local use of glycerin to arrest the progress of cataract, but his conclusions have not yet been corroborated by others. Some five years ago, a Committee was appointed by the Section on Ophthalmology of the American Medical Association to investigate the so-called medical cures of cataract. After extensive investigation, it reported "no cures."

Council on Medical Education and Hospitals

COMING EXAMINATIONS

ALABAMA: Montgomery, Jan. 9-13. Sec., Dr. J. N. Baker, 519 Dexter Ave., Montgomery.

AMERICAN BOARD OF DERMATOLOGY AND SYPHILOLOGY: *Oral.* New York, Dec. 13-16. Sec., Dr. C. Guy Lane, 416 Marlboro St., Boston.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY: *Written (Group B Candidates).* The examinations will be held in various cities of the United States and Canada, Dec. 9. Sec., Dr. Paul Titus, 1015 Highland Bldg., Pittsburgh.

AMERICAN BOARD OF OPHTHALMOLOGY: Cleveland, June 11. Sec., Dr. William H. Wilder, 122 S. Michigan Blvd., Chicago.

AMERICAN BOARD OF OTOLARYNGOLOGY: Cleveland, June 11. Sec., Dr. W. P. Wherry, 1500 Medical Arts Bldg., Omaha.

ARIZONA: Phoenix, Jan. 2-3. Sec., Dr. J. H. Patterson, 320 Security Bldg., Phoenix.

CALIFORNIA: *Reciprocity.* Los Angeles, Dec. 6. Sec., Dr. Charles B. Pinkham, 420 State Office Bldg., Sacramento.

COLORADO: Denver, Jan. 2. Sec., Dr. Wm. Whitridge Williams, 422 State Office Bldg., Denver.

DELAWARE: Wilmington, Dec. 12-14. Sec., Dr. Harold L. Springer, 1013 Washington St., Wilmington.

DISTRICT OF COLUMBIA: Washington, Jan. 8-9. Sec., Dr. W. C. Fowler, 203 District Bldg., Washington.

KANSAS: Topeka, Dec. 12-13. Sec., Dr. C. H. Ewing, Larned.

KENTUCKY: Louisville, Dec. 5-7. Sec., Dr. A. T. McCormack, 532 W. Main St., Louisville.

MARYLAND: *Regular.* Baltimore, Dec. 12-15. Sec., Dr. Henry M. Fitzhugh, 1211 Cathedral St., Baltimore. *Homeopathic.* Baltimore, Dec. 13-14. Sec., Dr. John A. Evans, 612 W. 40th St., Baltimore.

MINNESOTA: *Basic Science.* Minneapolis, Jan. 2-3. Sec., Dr. J. Charnley, McKinley, 126 Millard Hall, University of Minnesota, Minneapolis. *Regular.* Minneapolis, Jan. 16-18. Sec., Dr. E. J. Engberg, 350 St. Peter St., St. Paul.

NATIONAL BOARD OF MEDICAL EXAMINERS: The examinations will be held at centers in the United States where there are five or more candidates, Feb. 14-16. Ex. Sec., Mr. Everett S. Elwood, 225 S. 15th St., Philadelphia.

NORTH DAKOTA: Grand Forks, Jan. 2. Sec., Dr. G. M. Williamson, 4½ S. 3rd St., Grand Forks.

OHIO: Columbus, Dec. 6-8. Sec., Dr. H. M. Platter, 21 W. Broad St., Columbus.

OREGON: Jan. 2-4. Sec., Dr. Joseph F. Wood, 509 Selling Bldg., Portland.

PENNSYLVANIA: Philadelphia, Jan. 2-6. Sec., Mr. W. M. Denison, 400 Education Bldg., Harrisburg.

RHODE ISLAND: Providence, Jan. 4-5. Dir., Dr. Lester A. Round, 319 State Office Bldg., Providence.

SOUTH DAKOTA: Pierre, Jan. 16-17. Dir., Dr. Park B. Jenkins, Pierre.

VIRGINIA: Richmond, Dec. 6-8. Sec., Dr. J. W. Preston, 28½ Franklin Road, Roanoke.

WASHINGTON: *Basic Science.* Seattle, Jan. 11-12. *Regular.* Seattle, Jan. 13-16. Dir., Mr. Harry C. Huse, Olympia.

WISCONSIN: *Basic Science.* Milwaukee, Dec. 16. Sec., Prof. Robert N. Bauer, 3414 W. Wisconsin Ave., Milwaukee. *Regular.* Madison, Jan. 9-12. Sec., Dr. Robert E. Flynn, 401 Main St., LaCrosse.

Book Notices

Combined Text-Book of Obstetrics and Gynecology for Students and Medical Practitioners. By J. M. Munro Kerr, M.D., F.R.F.P. and S., F.C.O.G., Regius Professor of Midwifery, Glasgow University, J. Haig Ferguson, M.D., LL.D., F.R.C.S., Consulting Gynæcologist, Royal Infirmary, Edinburgh, James Young, D.S.O., M.D., F.R.C.S., Gynæcologist, Royal Infirmary, Edinburgh, and James Hendry, M.B.E., M.A., B.Sc., Professor of Obstetrics and Gynæcology, University of Glasgow. With contributions from Charles McNeil, M.A., M.D., Professor of Child Life and Health, University of Edinburgh, and J. Duncan White, M.B., Ch.B., D.M.R.E., Radiologist, Royal Infirmary, Edinburgh. Second edition. Cloth. Price, $10.00. Pp. 110, with 509 illustrations. Baltimore: William Wood & Company, 1933.

This is the type of book needed in this country for medical students. It is not quite the size of the best textbooks on obstetrics (De Lee and Williams) and yet it contains almost all the information a student need obtain from a textbook concerning both obstetrics and gynecology. It is true that there exist systems of books which combine the two subjects and that more of these systems are in process of preparation, but these are obviously not suitable for most undergraduate students. It is needless to point out that in a combined textbook of obstetrics and gynecology there is omission of needless repetition. This book, written by four of the leading teachers of obstetrics and gynecology of Scotland, is an excellent one, beautifully written and abundantly illustrated. The four authors divide the responsibility for the entire book, because the reader has no way of identifying the author of any particular section. There are a few points in the book with which one may take exception. The authors maintain that spinal anesthesia is valuable in certain obstetric cases, especially in cesarean section. Most authorities, even those who are enthusiastic about spinal anesthesia, recognize that pregnant women are especially susceptible to the dangers of this form of anesthesia. No mention is made of direct infiltration anesthesia, which is much simpler and far safer. Many of the illustrations show the vulva unshaved, especially for the delivery of a breech presentation. In the discussion on resuscitation of the new-born, there are illustrations of Schultze's swingings. This dangerous procedure should not even be mentioned in a textbook for students or practitioners. Likewise, Byrd's method should also be condemned because far better and safer means of resuscitating new-born babies are available today. In cases of transverse position of the head the authors prefer to apply one blade over the baby's face and the other over the occiput rather than resort to an oblique application. The former method of applying the blades is surely more harmful to the child. The authors condemn rupture of the membranes as a means of inducing labor, because there is often a delay in the onset of labor and consequent risk of infection. This method of inducing labor is rapidly becoming popular in the United States and, when properly performed, entails but little danger. Laminaria tents are looked on as the safest method of inducing abortion by the authors, but a dilation and curettement is simpler and not more dangerous. The authors discuss accouchement forcé and illustrate the Bossi dilator for this purpose; but this instrument was properly discarded long ago by most obstetricians. The authors advocate the use of an intra-uterine douche for the removal of débris after an abortion and for the control of postpartum hemorrhages. Intra-uterine douches are entirely unnecessary after abortions and there exist much more satisfactory, quicker and less dangerous methods of checking bleeding in the third stage of labor. The authors describe and illustrate the method of elevating a retroflexed uterus by means of inserting a sound into the uterine cavity and replacing the uterus. This is a hazardous and unnecessary procedure. In spite of these minor criticisms the book will prove to be of great value, for it contains most of the recent advances in obstetrics and gynecology.

Manuel pratique de dermatologie: Le diagnostic, la pose et ses résultats, thérapeutiques, les dermatoses. Par A. Doizy et A. Boutsiller. Avec la collaboration de Pierre Brocq, chirurgien des hôpitaux de Paris. In two volumes. Cloth. Price, 280 franc. Pp. 1232, with 640 illustrations. Paris: Masson & Cie, 1932.

Dedicated to the memory of Louis Brocq, a master of dermatology, this work follows his teachings but also contains necessary additions to bring it down to the present. The subject matter is divided into three major parts: (1) diagnosis, (2) the skin and its reactions and therapeutics, and (3) the dermatoses. The authors propose that, when confronted with a problem, the student who has mastered the "dermatologic alphabet" or elementary lesions should consult the diagnostic part, where he will find the name and photograph of the dermatosis and reference to the section on "the dermatoses" for more complete details. The illustrations, which are unusually good, bear descriptive legends, while further description and the differential diagnosis are contained in the text. In addition, many schematic drawings are reproduced to represent salient features. The illustrations are largely from the collection of Brocq supplemented by some from the museum of the Hôpital St. Louis and a few other sources. As one would expect, there is a full description of the ingenious diagnostic method originated by Brocq and named by him "grattage methodique." Appended to the diagnostic part is an excellent discussion of the dermatology of the new-born. This explains the predisposition of new-born infants to certain dermatoses on the basis of structural differences between the infantile and the adult skin. The second section, which deals with the skin and its reactions, is described in the preface as "a series of working hypotheses, founded on an accepted histophysiologic and biochemical basis through which the reader passes insensibly from the normal reaction to the inflammatory reactions of the integument, often prepared by modifications of the cutaneous soil." This part of the work is also replete with illustrative schematic drawings, and the remarkable clarity and systematization of the presentation stamps it as a masterpiece of dermatologic literature. The section devoted to dermatologic therapeutics includes a special article by Pierre Brocq on

surgery in dermatology. Due regard is given to all accepted methods of treatment and the choice of selection of therapeutic agents according to the special character or localization of the lesion. The third major division is on the dermatoses. Here the teachings of Brocq are especially evident in such concepts as prurits avec lichenification, parakératose psoriasiform, dermatites polymorphes douloureuses and dermatose figurée mediothoracique. Particularly commendable are the sections on cutaneous mycoses and microbic dermatoses. It is interesting to note the following dictum of Brocq, which is quoted in the dedication. "Bear in mind that to be a good dermatologist it is necessary to be a visualist, a patient and discerning analyst, a prudent clinician, a finished physician." The leading feature of this excellent treatise is the emphasis on clinical diagnosis, making it one of practical value. The work of the publisher is entirely satisfactory.

Le rôle biologique de la catalase dans le métabolisme d'énergie. Par J. H. Regenbogen, médecin à Leeuwarden (Hollande). Paper. Price, 36 francs. Pp. 139. Haarlem: de Erven F. Bohn N. V.; Paris: Gaston Doin & Cie, 1932.

In this monograph on catalase action the author reviews the earlier theories as to the action and function of catalase, also the more modern views on the liberation of energy in metabolism. Each theory is discussed and its defects and values are presented. The peroxidase and p_H factors are treated separately in some detail, after which the author presents his own views and his own theory. He points out that oxidative metabolism can be considered as a two phase process in which the anaerobic and aerobic phases proceed independently but rhythmically. The rhythm is controlled in the main by the p_H of the fluids at the surfaces of cells and by the effects of p_H changes in the activation and inactivation of the enzymes involved in these processes. The local p_H changes the author considers to be automatically controlled by insulin through its control of fatty acid metabolism. However, the p_H factor alone is not sufficient for the complete control of the rhythm in the two phases. Another factor enters and that is the formation and action of catalase. The function of the catalase is to aid in making the separation of the two phases absolute and to protect the cell from self combustion in the aerobic phase through its destructive action of the hydrogen dioxide formed and bound by peroxydases. However, it does not destroy the minute traces of free hydrogen dioxide found in cells, which are so necessary for the destruction of cellular toxins and for the liberation of molecular oxygen for cell respiration. The author emphasizes the need of an exact understanding of catalase action and function in connection with diabetes, arthritis, gout, obesity, arteriosclerosis, malignant tumors, and many skin diseases.

Physical Chemistry of Living Tissues and Life Processes as Studied by Artificial Imitation of Their Single Phases. By R. Beutner, M.D., Ph.D., Professor of Pharmacology, School of Medicine, University of Louisville. Cloth. Price, $5. Pp. 337, with 79 illustrations. Baltimore: Williams & Wilkins Company, 1933.

This is a systematic presentation of old and new observations on the physical and general physiologic aspects of the structure and activities of living forms. The argument is that "life is a scientific problem." This argument is approached in three ways. First, much use is made of exceedingly simple models, which in some degree simulate certain macroscopic features and behaviors of a few living forms. The action of salts in the swelling of colloids, in the transport of water and in osmotic changes is presented in simple language in connection with such models with the view of showing that similar mechanisms are at work in the living tissues. In the second approach an attempt is made to study the microscopic structure of a number of Bütschli's and Leduc's models, which show striking resemblance to certain living structures. In this connection the author also presents his view that the crystallization of a pure substance involves internal structural and external surface forces that are similar to those involved in the growth of a cell or tissue. The third approach involves a more detailed consideration of bio-electrical phenomena. The author states that "the production of bio-electricity primarily appears to be a characteristic of living matter just like color, density, viscosity and other physical qualities." He considers the nature of the electric potential observed in living forms and emphasizes the importance of the heterogeneous composition of protoplasm and the differential action of solvents, solutes, phase boundaries and membranes in its control. Naturally, the laws of electrical stimulation, the nature of polarization, the travel of waves of polarization and their physical causes are considered. Other interesting material is given in later sections of the book, such as a brief treatment of artificial parthenogenesis and a fair review of Gurwitsch's observations on mitogenetic rays. The appendix is devoted to a more mathematical treatment of investigations on membrane equilibrium and its bearing on water exchange swelling and osmotic pressure. The author closes his arguments with a plea for the synthetic method of approach by means of artificial models, in spite of his admission that the difficulties involved in constructing one of the most elementary forms of life are practically insurmountable. The work presents a good summary of the more obvious physical aspects of general physiology, with possibly a tendency to make the problem seem less simple than it really is from a purely chemical point of view. One is struck by the tendency to ignore the importance of specific tissue constituents and of specific tissue activities in the normal physiologic history of a cell or tissue.

Urographic Urology. By Stanley R. Woodruff, M.D., F.A.C.S., Associate Professor of Urology, Columbia University and New York Post Graduate Medical School and Hospital. Cloth. Price, $15. Pp. 255, with illustrations. New York: Wainick Printing Company, Inc., 1931.

This presentation is essentially clinical. No attempt is made to go into the details of histology and pathology. When laboratory details are of interest, they are mentioned. The subject matter is excellently arranged. The illustrations are unusually clear and sharply defined and the various lesions are generously illustrated. The monograph serves as an excellent everyday working aid not only to the urologist but also to the roentgenologist, to the surgeon and to the internist, who so often are confronted with borderline problems in differential diagnosis. The author is to be complimented particularly on his discussion of each case under the heading of urologic impressions. The appearance of the urograms and the clinical history together make for simplicity in reference by the busy practitioner.

The Diagnosis and Treatment of Diabetes and the Use of High Carbohydrate Diets. By W. Wilson Ingram, M.C., M.D., Honorary Physician and Physician in Charge of the Clinic for Diabetes Mellitus, Royal North Shore Hospital, Sydney, and G. V. Rudd, M.Sc., Research Biochemist, Institute of Medical Research, Royal North Shore Hospital, Sydney. With preface by C. G. Lambie, M.C., M.D., F.R.C.P., Bosch Professor of Medicine, University of Sydney. Cloth. Pp. 88, with illustrations. Sydney, Australia: Angus & Robertson, Ltd., 1933.

This gives the shortest and simplest possible exposition of the diagnosis and treatment of diabetes mellitus. Although it is intended primarily for the physician, the almost complete absence of technical terms and the elementary nature of the theoretical references make the volume suitable for the well informed layman. The book is particularly designed to meet the conditions of medical practice in Australia, and the dietary instructions are based on the energy requirements and food materials indigenous to that continent. The diets advised by the authors are presented in a series of weighed daily diets of ascending caloric value, in which the food materials may be varied by the use of substitution tables. All diets are moderately high in carbohydrate, the fatty acid: dextrose ratio being 0.75: 1 throughout. As in all similar dietary systems, flexibility for individual requirements is sacrificed to simplicity.

A Laboratory Manual of Neuro-Anatomy. By C. L. Davis, M.D., Professor of Anatomy, University of Maryland, and H. S. Rubinstein, B.S., M.D., Instructor in Neuro-Anatomy and Assistant in Medicine, University of Maryland. Part II: Stereographic Plates. Boards. Price, $3. 30 plates. Baltimore: William Wood & Company, 1933.

It is difficult to review the second part of a work of which the first part has not yet been published. The material at hand consists of a series of thirty stereoscopic photographs illustrating the gross structure of the brain. They are well chosen and accompanied by excellent descriptive sketches. They will be useful to students and teachers of psychology who have need of rudimentary information concerning the structure of the brain but cannot supplant an actual dissection as an introduction to the study of the brain in medical schools.

Miscellany

MATERNAL MORTALITY

Abstract of the Report on "Maternal Mortality in New York City," 1930, 1931, 1932, Issued by the Committee on Maternal Mortality of the New York Academy of Medicine

In 1930 the New York Academy of Medicine organized a committee of physicians to study maternal mortality in New York City. The work of the committee was conducted with the aid of a grant from the Commonwealth Fund.

In the three years embraced by the study, 2,041 maternal deaths occurred in New York City. Of this number the committee estimates that 1,343, or 65.8 per cent, would have been preventable "if the care of the woman had been proper in all respects." By a careful review of every death that occurred, the committee established to the extent possible the factor or factors that were responsible for the fatality.

Responsibility for the occurrence of the 1,343 deaths which the committee adjudged preventable was distributed among physicians, patients and midwives. To the medical group 61.1 per cent of the preventable deaths are charged. The patient is held responsible for 36.7 per cent of the deaths, and the midwife for 2.2 per cent of the total of these deaths.

These figures, startling as they are, do not, however, in the judgment of the committee, give a reasonable picture of the problem. Hence the report of the committee devotes much attention to the various factors affecting puerperal mortality, such as the widespread use of anesthetics, the decline in spontaneous deliveries, the greater frequency with which operative measures are employed, cesarean sections, hospital and home deliveries, prenatal care, economic status, and a score of other important items.

"Sixty per cent of all deaths," the committee state in its report, "which could have been avoided have been brought about by some incapacity in the attendant: lack of judgment, lack of skill, or careless inattention to the demands of the case. Some of these situations have arisen out of the fact that interns have been given too wide a field of independent activity. Most are plainly the results of incompetence. Prevention in this field will mean increasing the respect of the physician for the gravity of obstetrical operations and educating him to greater caution in attacking problems which are properly the field only of the highly trained obstetrician."

ANESTHESIA

In the detailed study of the factors that influence maternal mortality, the committee finds that "the use of anesthesia during labor and delivery has grown steadily in extent since its introduction in the last century and is a problem of the most pressing importance, more so in the United States than in any other country. This has come about to a large extent through pressure from the lay public. The women of the large urban centers have become steadily more insistent in their demands for shorter and less painful parturition, and the accoucheur may disregard these demands only at great risk to his own practice. . . .

"The wide effects of the increased use of anesthesia can only be guessed at, but the direct effect of the administration of the anesthetic in its tendency to lessen and enfeeble the expulsive powers of the uterine musculature must be reflected in an increased necessity for artificial assistance at delivery. The frequent use of instrumentation is based upon the easy accessibility of anesthesia. It is the opinion of many observers that the increase in the use of anesthesia is a factor in keeping the maternal mortality rate stationary."

OPERATIVE DELIVERY

The committee finds that a prominent feature of the development of modern obstetric practice has been a steady increase in the proportion of operative deliveries. According to authoritative estimates, not more than 5 per cent of all delivery cases require operative intervention. A study of the records of sixty-seven hospitals in which almost 75 per cent of all hospital deliveries occur shows that operative intervention is practiced in 24.3 per cent. In the city as a whole it is estimated that one out of every five deliveries is an operative delivery. In comparing the maternal deaths in operative deliveries and those in which the delivery was spontaneous, the committee found that the maternal mortality was five times as high among the operative deliveries as among the spontaneous ones.

In commenting on this finding, the committee states: "That the increase in the use of instrumentation brings with it an increased hazard is evident if the relative rates for spontaneous and operative delivery are examined. We cannot disregard the enormous difference between them. The death rate for spontaneous deliveries is less than one-fifth that for the operative. Clearly this represents a serious defect in the management of these cases. . . .

"It is not contended that the rates can be made equal: the necessity for operative interference arises, at times, out of serious abnormalities or disturbances of the mechanism of labor, which, in themselves, greatly increase the hazards. But any such disparity as that shown in these figures is a certain indictment of those undertaking the interference."

The committee believes that "a reduction of the mortality rate can be achieved through a reduction in operative interference."

"Increasing demand on the part of the patient for shorter and less painful parturition (delivery), the greatly increased use of anesthesia, the spread of the knowledge of surgical technics, and the pressure of time upon the attendant," the committee believes, "is responsible for the increase in operative deliveries."

CESAREAN SECTION

While all surgical maneuvers have increased in obstetrics, the incidence of cesarean sections has increased notably. In 1910 in one of the large New York hospitals, only 2 in 1,000 deliveries were made by cesarean section. In 1927 the number increased to 25.

The committee finds that the incidence of cesarean sections in the hospitals of the city is high. While 2.2 per cent of all deliveries were made by cesarean section, this operation was responsible for almost one fifth of all the deaths.

HOSPITAL AND HOME DELIVERIES

A little less than 30 per cent of all deliveries studied during the three year period took place in the home. During the same period but 14.5 per cent of the 1,343 preventable deaths followed delivery in the home. The relative death rate per thousand live births for hospital and home deliveries is therefore 4.5 per thousand live births in the hospital and 1.9 per thousand live births in the home. The maternal mortality rate for home deliveries is therefore substantially less than half of that in the hospital deliveries. However, in evaluating these figures, it should be remembered that only those deliveries which are unassociated with serious abnormalities are usually undertaken in the home. When the labor becomes unduly prolonged or serious accidents occur in its course or the prognosis is unfavorable, the case is either referred to or transferred to the hospital. The record of hospital deliveries is therefore deeply affected by the selected nature of the cases in which delivery occurs at home.

In reviewing the matter, however, the committee observes that "the great increase in the hospitalization of the normal parturient has failed to bring the hoped-for reduction in puerperal morbidity and mortality, and this in spite of great advances in our knowledge of the processes involved and the proper way of treating them. It would seem that the present attitude toward home confinement requires reexamination, and a program looking toward an increase in the practice of domiciliary obstetrics deserves careful investigation."

ECONOMIC STATUS AND MATERNAL MORTALITY

The economic status of the prospective mother, the committee's studies reveal, appreciably affects her well being and the safety with which she may expect to pass through the birth experience. In making a detailed study of 341,879 births that occurred in the three year period under consideration, and divid-

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ing the mothers into four groups designated respectively A, B, C and D, A representing the slum population, B the depressed economic artisan class, C the so-called white collar group and D the group most favorably situated economically, it was found that their comparative maternal mortality based on figures (which excluded the deaths following abortion and ectopic pregnancies) were as follows: 4.9 deaths per thousand live births for the slum population, 4.2 in the artisan group, 4.6 in the white collar class, and 3.9 in those most favorably situated economically. The difference between the extremes, group A and group D, is therefore 20 per cent.

MIDWIFE PRACTICE

While approximately 10 to 12 per cent of the births in New York City and throughout the country occurred under the supervision of midwives, the committee finds that provision for the proper education, registration and supervision of midwives is exceedingly inadequate in most states in the Union. Two schools for midwives are in operation in New York City. However, the committee found that "a large number of the practicing midwives in New York City are foreign-born women who were trained in the country of their birth and came to this country and began the practice of midwivery before the present laws regarding licensure were put into effect." New York City has at the present time 863 licensed midwives. These attend approximately 10 per cent of the annual births.

The committee interviewed fifty-nine midwives who had either delivered or been in contact with a patient whose case ended fatally. Of the fifty-nine midwives interviewed, nineteen were adjudged by the committee to be competent, twenty were thought to be only fairly competent and twenty were incompetent. When judged on the basis of their obstetric results, the record of midwifery deliveries compared to deliveries by physicians, the committee found "that there is no great disparity between the results of the work done by the two groups."

In reviewing the problem of midwifery which in the United States has been regarded until recently as a necessary evil to be done away with as soon as possible, the committee states that, "contrary to the generally accepted opinion, the midwife is an acceptable attendant for properly selected cases of labor and delivery. There has never been a contention that she has any place except for the normal delivery at home, but we have seen that her results are as good as those obtained by the physician under what are justly regarded as comparable circumstances and for comparable cases.

"Of the midwives seen and interviewed, it is significant and must be borne in mind that less than a third were judged to be competent, and in the face of incompetence or only fair training and ability the results were by no means prejudicial to the midwife. . . .

"Proper training is the first requisite and there is an increasing tendency among part of the medical profession to see that it is provided. . . . After proper training there must be suitable, adequate and cooperative supervision and control of that practice.

"The midwife should have a position in the scheme for providing maternity care. It remains for the medical profession to define what that position should be. She is able to supply attendance and nursing care for a smaller compensation than the costly training of a physician requires, but the necessity for every woman to have adequate care during pregnancy and at delivery, and to have the services of a physician if and when those services are needed, must be kept in mind.

"It is necessary, first of all, to provide midwives who are properly trained. It would not seem absolutely necessary that a nurse's training be a prerequisite to training as a midwife, but in order to extend the practice of employing midwives as accoucheuses in normal parturition, a different type of woman must be brought into the field. The present type of non-nurse midwife would prove wholly unacceptable to certain classes of the community. While the only slightly educated woman with adequate training may be a capable midwife, the more educated patient will demand a different type of attendant. The two groups need not be mutually exclusive. There should be opportunities for both to receive the necessary training. . . .

"The midwife should be encouraged and, if necessary, required to return for short courses at certain intervals. Her training must prepare her to understand the mechanisms of normal labor and delivery. She must be able to detect the signs of the abnormalities of pregnancy, and she must be able to measure the pelvis accurately. She must be thoroughly familiar with a simple method for maintaining asepsis. Finally, she must be equipped to give suitable care to both mother and infant during the puerperium. . . .

"The medical profession must accept the midwife as one of its adjuncts. Physicians must make themselves responsible for her proper training and supervision as such. They must regard her as an ally in the effort to reduce the morbidity and mortality associated with childbearing. Both officially and privately there must be an alteration in the prevailing attitudes toward her. There must be a readiness to cooperate with her to insure the results both physician and midwife are anxious to achieve."

CONCLUSIONS AND RECOMMENDATIONS

The committee ends its report with a number of concrete recommendations:

"To improve this situation and remove the causes out of which it arises, it is evident that there must be a determined effort to educate both the lay public and the medical profession to an understanding of the necessity for change in certain of the methods now employed. The profession itself must accept the responsibility for educating the lay public to a better understanding of the aims of obstetrics and the methods by which those aims may be realized. But prior to that must come increased education of the profession, that it in turn may wisely inform the lay public.

"First, a prospective mother must have further instruction in the necessity for prenatal care. She must be taught that prenatal care does not mean merely registering for confinement; that it is imperative to obtain that care as early as pregnancy is suspected; that one visit at which no abnormalities were discovered is no guaranty of continuing good health but that regular return for observation is vital if her attendant is to be enabled to give her the best possible care; that previous normal pregnancies and deliveries do not assure subsequent normal ones; that proper and sufficient prenatal care offers her the greatest assurance of an uneventful confinement.

"Furthermore, some information must be made available to the patient as to the standards of such prenatal care. She should have some knowledge of the purposes of such care and what she may expect from her attendant as the minimum requirements of a proper prenatal supervision. She should know that the omission of urinalysis, blood pressure determination, or the measurement of her pelvis constitutes negligence; that a thorough physical examination is a necessary part of proper care. She must be informed of the possible gravity of symptoms that seem to her mild, and the fact that early treatment is the prerequisite to the prevention of later trouble.

"The medical profession is obligated to inform the lay public that operative delivery undertaken merely to alleviate pain or shorten labor involves increased risk for both mother and baby.

"The relative safety of delivery at home should be emphasized. Effort should be made to induce women who cannot obtain adequate medical or hospital care to avail themselves of the services of qualified midwives under the supervision of physicians.

"To accomplish this education, the medical profession must assume a rôle which heretofore has been left to lay organizations. Confidence of the lay public in the medical profession will enable this to be done with greater authority and increased chances of success. . . .

"To do this well, the outstanding members of the profession in every community must actively interest themselves in the process. Obstetrical societies would do well to use the channels of the press and radio to broaden the sphere of their activities in this line. They would further increase their educational function by issuing authoritative pamphlets from time to time. They must assume responsibility for the teaching given through social service and lay organizations. . . .

"Hospitals, in order to qualify for recognition by the controlling authorities, must have qualified obstetricians as directors of their staffs. . . . The hospital must maintain a special

clinic for prenatal care, in charge of a member of the visiting obstetrical staff. There must be a sufficient number of beds set aside for the hospitalization of clinic patients with complications. There must be a social service department adequate, as to training and personnel, to keep in touch with all patients, to insure early registration and regular attendance; to facilitate the patients' cooperation through home adjustments; to assist in the educational function of the hospital to the community.

"All hospitals must maintain separate delivery rooms where only obstetrical cases are treated. The rules for the maintenance of asepsis must be rigid, including masking, the importance of which deserves reemphasis. Labor rooms must be sufficient to insure their availability to all patients. Isolation must conform to the most stringent regulations and include proper technic on the part of the nursing staff. All nursing must be done by properly supervised nurses, who should be especially trained in obstetrical nursing. The resident staffs must be under supervision at all times. There must be an invariable rule requiring the responsible attending physician to see patients promptly and supervise directly the residents who are assigned to them. Furthermore, the less experienced members of the staff must be under supervision of the responsible heads. . . .

"Proprietary hospitals should be brought under the supervision of a responsible board of hospital control and unless they provide adequate facilities as described above, except for prenatal care and social service, they should not be permitted to accept obstetrical patients.

"The situation in regard to midwives must be altered. More schools are needed for their training, including both women who have had previous training as nurses and those who have not; effort should be made to enrol types of women who would be acceptable to groups of the population now unwilling to employ a midwife, and the nurse-wife is suitable for this purpose. Licensure should be based upon examination. Additional short courses, at stated intervals, should be compulsory. Supervision should be increased, and changed to include actual oversight of cases under care. With physicians in charge, appropriately trained nurse-midwives might make suitable supervisors. Midwives should be required to report births within forty-eight hours, to report immediately any abnormality during labor, and to call consultation if labor continues beyond a definite time limit. The physician must be prepared to give the midwife unqualified cooperation. Some hospitals might well make use of midwives to conduct the deliveries in their outpatient service, under the direction of the inpatient obstetrical department.

"The hazards of childbirth in New York City are greater than they need be. Responsibility for reducing them rests with the medical profession."

Medicolegal

Malpractice: Failure to Remove Sponge After Tonsillectomy.—The defendant, a physician, removed the plaintiff's tonsils, Oct. 18, 1927, under a general anesthetic. After the operation, the plaintiff had a severe cough, pain in the left chest, peculiar expectoration, and fever. About Jan. 1, 1928, the plaintiff consulted another physician, who found a lung abscess. Among other efforts to be cured, the plaintiff went to a clinic in Philadelphia, where, by successive operations, a hole was burned with a cautery through the pleura and into the lower lobe of the lung to drain the abscess. Feb. 2, 1930, during a lung hemorrhage, the plaintiff coughed up a batting sponge. Attributing the presence of the sponge to the defendant's negligence, the plaintiff sued. The trial court directed a verdict for the defendant, and the plaintiff appealed to the Supreme Court of Michigan. The defendant-physician testified that *gauze* sponges were used by him during the tonsillectomy; the plaintiff's testimony was to the effect that they were of *batting*. In the operation in Philadelphia, said the court, gauze was used, and, if any batting was used in the treatment to swab the wound, it would normally be discharged by way of the wound and would not be coughed up. In removing tonsils there is danger of foreign and infected matter getting into air passages of the lungs, especially by gasping and heavy breathing of the patient, and a natural result thereof is lung abscess. On the question of whether the verdict was properly directed against the plaintiff, said the Supreme Court, the evidence must be viewed in the light most favorable to her. The record shows that the plaintiff coughed from the lung a batting sponge. How did it get into the lung? There was evidence negativing its getting there during the operation in Philadelphia, and, continued the court, the jury would be justified in so finding from the record. Furthermore, the jury might find the remaining opportunity to be in the operation done by the defendant. Such a finding might have support in the element of time, for the lung abscess, a natural result of the entry of the foreign matter into the lung, followed the operation performed by the defendant. If this be the finding, said the court, then this is not a case where losing the sponge was observed and prompt and proper effort made to remove it, but a case where the sponge was lost unobserved and negligently, and the case stands on a par as regards negligence with those cases where sponges have been left in incisions. The rule, said the court, in such cases is stated in 21 R. C. L. 388:

> Probably the most common instance of malpractice which is brought into the courts arises out of surgical cases where the physician or attendant has left a sponge in the wound after the incision has been closed. That this is plainly negligence there is no doubt at all, and it matters not at all that many physicians testify that the best of surgeons sometimes leave a sponge or some other foreign substance in the bodies of their patients, for this is testimony merely to the effect that almost every one is at times negligent. Whether the particular act was negligent is for the jury to decide after considering the circumstances of the case.

The question of negligence, therefore, was held by the Supreme Court to be for the jury, and the trial court erred in entering a directed verdict for the defendant. The case was remanded for a new trial.—*McKinstry v. Matthews (Mich.), 247 N. W. 75.*

Evidence: When Opinion of Expert Witness Invades Province of Jury.—An expert witness may express an opinion as to whether or not a physician has been guilty of malpractice by commission or omission. On the ultimate issue of whether a patient's condition resulted solely from malpractice, however, an expert witness invades the province of the jury when he goes beyond stating that the condition *could*, and in saying that it *did*, so result. Such an opinion is but the private judgment of the witness and is not competent evidence. Whether the alleged malpractice could cause the result complained of is a question of science only. Whether the malpractice did occasion such result, usually a matter of controversy, is not a question of mere science. When a result could have been occasioned by one of two or more causes, the ultimate fact of which cause occasioned the result is for the determination of the jury. A medical expert may not, in case of conflicting evidence, invade the province of the jury and testify that the result was in fact occasioned by one cause only.—*De Groot v. Winter (Mich.), 247 N. W. 69.*

"Imbecility of Mind" Defined.—The term "imbecility of mind," says the Court of Appeals of Kentucky, is not susceptible of exact or comprehensive definition. It is generally applied to indicate a mental condition between feeblemindedness and idiocy. Mental imbecility consists of the absence of or change in the faculty of reasoning and discerning, which renders a person incapable of taking care of himself and administering his affairs.—*Downing v. Siddens (Ky.), 57 S. W. (2d) 1.*

Society Proceedings

COMING MEETINGS

Medical and Surgical Association of the Southwest, El Paso, Texas, Dec. 7-9. Dr. W. Warner Watkins, Box 1587, Phoenix, Ariz., Secretary.

Philippine Islands Medical Association, Manila, Dec. 12-15. Dr. Antonio S. Fernando, 817 Taft Avenue, Manila, Secretary.

Society for the Study of Asthma and Allied Conditions, New York, Dec. 9. Dr. W. C. Spain, 116 East 53d Street, New York, Secretary.

Southern Surgical Association, Hot Springs, Va., Dec. 12-14. Dr. Robert L. Payne, 142 York Street, Norfolk, Va., Secretary.

Western Surgical Association, Cincinnati, Dec. 8-9. Dr. Frank R. Teachenor, 306 East 12th Street, Kansas City, Mo., Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to Fellows of the Association and to individual subscribers to THE JOURNAL in continental United States and Canada for a period of three days. Periodicals are available from 1925 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 12 cents if two periodicals are requested). Periodicals published by the American Medical Association are not available for lending but may be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American J. Obstetrics and Gynecology, St. Louis

26: 147-310 (Aug.) 1933

Observations on Endocrine Diagnosis and Treatment of Amenorrhea and Functional Uterine Bleeding. B. M. Anspach and J. Hoffman, Philadelphia.—p. 147.
Five-Year Study of Abortion. R. E. Watkins, Portland, Ore.—p. 161.
Hematometra Cervicalis, with Especial Reference to Pelvic Endometriosis. R. A. Lifvendahl, Chicago.—p. 173.
*Nephritis in Pregnancy. H. J. Stander, New York.—p. 183.
*Value of Aschheim-Zondek Reaction in Diagnosis and Prognosis of Chorionepithelioma. C. Mazer and L. Edeiken, Philadelphia.—p. 195.
Incidence and Significance of False Positive Pregnancy Reactions. A. J. Zuerman, Philadelphia.—p. 204.
Results of Intra-Uterine Cultures Obtained with Sheath Tube. J. K. Jaffe, Philadelphia.—p. 212.
*Influence of Female Sex Hormone on Blood Coagulation of the New-Born. J. C. Hirst, Philadelphia.—p. 217.
Importance of Pulse Rate in Labor. B. G. Hamilton, Kansas City, Mo.—p. 224.
Roentgen Differentiation of Types of Intestinal Vaginal Fistula. Harriet C. McIntosh, New York.—p. 231.
Benign Uterine Hemorrhage Treated with Radiation Therapy: Review of One Hundred and Forty-Seven Cases. S. Rubenfeld and R. J. Maggio, New York.—p. 237.
Weight Changes in the Last Four Months of Pregnancy: Study Based on Six Hundred and Sixty-Three Cases of Normal Pregnancy and Pregnancy Complicated by Toxemia. R. S. Siddall and H. C. Mack, Detroit.—p. 244.
Acute Inversion of the Uterus: Report of Four Cases. G. H. Davis, Brooklyn.—p. 249.
Urinary Suppression and Uremia Following Transfusion of Blood. R. A. Johnson and J. F. Conway, Boston.—p. 255.
*Direct Intra-Abdominal Radiation in Advanced Pelvic Carcinoma. E. A. Schumann, Philadelphia.—p. 260.
Unusually Large Ovarian Cyst. G. Gibson, Brooklyn.—p. 264.
Torsion of the Normal Fallopian Tube. F. B. Block and M. A. Michael, Philadelphia.—p. 268.
Abruptio Placentae (Complete) with Spontaneous Partial Rupture of the Uterus. S. L. Siegler, Brooklyn.—p. 270.
Rupture of Uterus Following Previous Cesarean Section: Report of Three Cases. J. Cassagnde, Brooklyn.—p. 273.
Rupture of Uterine Scar and Urinary Bladder Following Cesarean Section. I. Wilens, New York.—p. 274.
Teratocormus, Cyllosoma. T. M. Boulware and C. B. Flinn, Birmingham, Ala.—p. 276.
Vaginal Retractor for Operations on Cervix. J. S. Diasio, New York.—p. 278.

Nephritis in Pregnancy.—From a follow-up study of a large series of pregnant patients in whom the diagnosis of nephritis was established, Stander concludes that the prognosis is grave, the average maternal mortality occurring within ten years being approximately 40 per cent. It is his belief that the strain of the pregnancy on the function of the kidneys greatly aggravates an underlying chronic nephritis and thereby materially shortens the life of the patient. To help in the early recognition of nephritis he advocates the employment of the urea clearance and fifteen-minute phenolsulphonphthalein tests. The creatinine excretion test may also be employed, although it perhaps measures the tubular instead of the glomerular function. In addition to these tests, the patient's past history, the duration of pregnancy, the behavior of the blood pressure, albuminuria and edema under hospitalization with proper dietary measures, the examination of the eyegrounds, the cardiovascular system, and blood and urine chemistry are all aids in establishing a correct diagnosis. The best treatment for chronic nephritis in a pregnant woman is the termination of the pregnancy and the prevention of any further pregnancy.

Aschheim-Zondek Reaction in Chorionepithelioma.—Mazer and Edeiken point out that abnormal uterine bleeding following a normal or a mole pregnancy should not be treated by radium, because it masks the local symptoms of chorionepithelioma. It is impossible to make an early diagnosis of chorionepithelioma by means of uterine curettage. The authors present two cases of chorionepithelioma which show by contrast the value of the Aschheim-Zondek reaction in the diagnosis and the prognosis of the disease. The source of the hormone prolan, responsible for the Aschheim-Zondek reaction, is living chorionic epithelium, which should not persist longer than two weeks after the termination of a normal pregnancy or eight weeks after expulsion or operative removal of a mole pregnancy. The quantity of prolan excreted is proportional to the amount of abnormal chorionic epithelium present; hence a gradual increase in prolan excretion accompanying abnormal uterine bleeding following the termination of a normal or a mole pregnancy is indicative of a proliferative process, chorionepithelioma. Persistence of the Aschheim-Zondek reaction after extirpation of the uterus for chorionepithelioma points to metastasis, which should be located and treated by means of intensive irradiation. Prolan is probably a placental hormone and exerts its influence on the ovaries through the medium of the anterior pituitary lobe. The degree of ovarian response in chorionepithelioma is variable, depending on intrinsic ovarian conditions and the responsiveness of the anterior hypophysis to prolan stimulation.

Female Sex Hormone and Blood Coagulation of the New-Born.—Hirst proposes to show the effect of certain standardized preparations of estrin on normal new-born infants and on several abnormal infants, including one case of moderate hemophilia. The study of each group consisted mainly in noting the duration of bleeding without pressure from heel punctures, and the time required for coagulation of blood drawn into uniform machine-made capillary tubes. He found that the normal coagulation and bleeding times of both male and female new-born infants are nearly constant between three and a half and four minutes for the first eleven days. The injection of solution of crystallized estrin (theelin) produced a moderate reduction of the blood curves in normal male and female infants. Injections of progynon were followed by a definite increase of the bleeding and coagulation times in normal new-born infants of both sexes. Abnormally long coagulation and bleeding times, as well as spontaneous bleeding other than vaginal, were corrected by injections of theelin. Breast engorgement in both sexes was produced by injections of female sex hormone indicating a direct effect of estrin on the breasts of new-born infants rather than an indirect result through the activation of a prepituitary specific hormone. Vaginal (uterine) bleeding was initiated by estrin administration. Icterus neonatorum appeared to clear up more rapidly than usual, under injections of theelin. The author is ascertaining whether icterus may be prevented by the early administration of estrin.

Intra-Abdominal Radiation in Advanced Carcinoma.—Schumann outlines a procedure designed to further the attack on advanced pelvic carcinoma by applying roentgen rays directly to the affected tissues without the intervention of the abdominal parietes. The patient, under tribrom-ethanol anesthesia, is placed in the lithotomy position, biopsy is performed, the nature and extent of the carcinomatous infiltration are determined by bimanual examination, and 50 mg. of radium is applied to the cervix or to the uterine cavity, with such filtration as is deemed appropriate for the individual case. Then in the Trendelenburg position the abdomen is prepared for laparotomy, a median incision from 6 to 8 inches in length is made, and the abdominal walls are widely separated by means of a Balfour retractor. The intestine is carefully walled off with a large gauze pad, after which the abdominal wall and all the pelvic tissues except those involved in the malignant growth are protected from irradiation by being covered with sheet lead, 2 mm. in thickness. Strips of lead are cut to fit the interior of the abdomen and are then snugly molded into position with the fingers so as to isolate the tumor area; all other tissues are covered by strips of lead. A large sterile dressing is then applied and the patient is given a full therapeutic dose of roentgen radiation; i. e., 150 milliamperes at a distance of 18 inches, 130 kilovolts, 6 mm. of aluminum filtration. On the completion of the treatment the sterile dressing is replaced, the lead and gauze packs are removed, and the incision is closed. No attempt is made to remove any of the malignant tissues. The author has performed this operation on three women without any postoperative complication or any particular discomfort to the patients.

Archives of Internal Medicine, Chicago

52: 165-340 (Aug.) 1933

Therapeutic Effect of Total Ablation of Normal Thyroid on Congestive Heart Failure and Angina Pectoris: III. Early Results in Various Types of Cardiovascular Disease and Coincident Pathologic States Without Clinical or Pathologic Evidence of Thyroid Toxicity. H. L. Blumgart, J. E. F. Riseman, D. Davis and D. D. Berlin, Boston.—p. 165.

Clinical Studies of Respiration: II. Influence of Determination of Basal Metabolism on Respiratory Movements in Man, and Effect of These Alterations on Calculated Basal Metabolic Rate. J. A. Greene, Iowa City, and H. C. Coggeshall, Indianapolis.—p. 226.

*Benign and Malignant Neutropenia: Present Status of Knowledge of This Condition, with Report of Four Cases. Regena C. Beck, Richmond, Va.—p. 239.

Cholesterol and Lecithin Phosphorus in the Plasma of Anemia Other Than Pernicious Anemia: Influence of Therapeutic Measures on These Constituents. Gulli Lindh Muller and C. W. Heath, Boston.—p. 288.

Effect on Reflexes of Carotid Sinus of Raising Intracranial Pressure. C. M. Guernsey, S. A. Weisman and F. H. Scott, Minneapolis.—p. 306.

*Absorption of Dextrose by Rectum. W. S. Collens and L. C. Boas, Brooklyn.—p. 317.

*Pleurisy in Rheumatic Fever: Clinical Observations. W. K. Myers and E. B. Ferris, Jr., Boston.—p. 325.

Benign and Malignant Neutropenia.—Beck reports four cases: two of primary malignant neutropenia as described by Schultz, one of primary subchronic recurring benign neutropenia, and one that began as a fulminating case, with recovery, and three months later recurred as a primary subchronic benign neutropenia. These patients did not give a history of exposure to any of the physical or chemical agents known to produce benign or malignant neutropenia, nor did they give a history of any previous infection that might have had a bearing on the disease. The clinical picture at the inception of the illness was the same for all four patients; in the patient with the typical subchronic recurring benign neutropenia, the onset was more gradual. These cases suggest that there is a fundamental difference in the pathologic changes underlying the recovered and the fatal cases. In the fatal cases, the maturation of granulocytes had ceased and the granulopoietic tissues were exhausted. A maturation factor for granulocytes has not yet been discovered, so that a specific treatment could not be applied. In the recovered cases, maturation was arrested and the granulopoietic tissues were not exhausted, the fault seeming to be in the lack of a chemotactic factor to call the granulocytes to the circulating blood. In one of the two cases of primary malignant neutropenia, the roentgen rays in some unknown way stimulated this function to normal. Doan's theory is that the roentgen rays bring about a destruction of some of the intact myeloid foci with a liberation of autogenous nucleotides, which then initiate the maturation and delivery of granulocytes from the remaining myeloid foci. In the patient with the typical subchronic recurring benign neutropenia, which was more mild, this function righted itself in time to prevent irreparable damage.

Absorption of Dextrose by Rectum.—In determining whether or not dextrose can be absorbed by the rectum, Collens and Boas observed that in the nondiabetic group there is a rise in the blood sugar ranging between 16 and 25 per cent and that the amount of dextrose recovered at the end of the experiment varies between 10 and 27 per cent at the end of two hours. This indicates that as much as 90 per cent of the dextrose administered by rectum was absorbed. In the diabetic group, much the same picture prevails except for the fact that two patients showed no rise in the blood sugar, and one even experienced a 20 per cent decrease. The other four diabetic patients had elevations in the blood sugar of 9, 21, 38 and 50 per cent. All, however, showed evidence of absorption by the analysis of the rectal return. In the patient in whom there was a decrease in the blood sugar, only 14 per cent of the amount administered could be recovered at the end of two hours. The authors present further evidence that dextrose is absorbed in significant quantities by the fact that a diabetic patient, who had recently experienced an attack of hypoglycemia as the result of an overdosage of insulin, was immediately relieved by the administration of 25 Gm. of dextrose by rectum. The authors' series consisted of twenty-four nondiabetic patients, eleven of whom received 250 cc. of a 10 per cent solution of dextrose (25 Gm.); seven, 250 cc. of a 25 per cent solution of dextrose (50 Gm.); five, 400 cc. of a 5 per cent solution (20 Gm.), and one, 200 cc. of a 50 per cent solution (100 Gm.). Two of the diabetic patients received 250 cc. of a 10 per cent solution of dextrose; two, 200 cc. of a 25 per cent solution (50 Gm.), and three, 400 cc. of a 5 per cent solution. At the end of two hours the patients were given an enema with 500 cc. of tap water, and the evacuation was collected. These returns were analyzed for the dextrose content by the Benedict quantitative method for estimation of sugar in the urine.

Pleurisy in Rheumatic Fever.—Myers and Ferris observed fifteen patients suffering from rheumatic fever with pleural lesions. Thirteen had rheumatic pleurisy; three, fibrinous pleurisy, and ten, pleurisy with effusion. Two patients had bilateral hydrothorax due to myocardial failure during the acute stages of rheumatic fever. Involvement of the pleura was characterized by the sudden onset and by dyspnea, orthopnea, mild cyanosis, pain (depending on the nature of the pleural lesion) and a febrile response varying in severity and duration. Evidence pointed to concurrent pulmonary lesions in the patients who had true rheumatic pleurisy. The pleural lesions were found to be independent of pericarditis and were related to underlying pulmonary processes. The hemorrhagic nature and the readiness with which clot formation took place characterized the fluid of rheumatic pleurisy. Polyarthritis was preceded by involvement of the pleura and lung in two instances. Salicylates did not alter the course of the pleural and pulmonary lesions and, indeed, failed to relieve completely the articular symptoms in the presence of an extension of the rheumatic process to the pleura and lung.

Archives of Ophthalmology, Chicago

10: 161-292 (Aug.) 1933

*Specific Treatment of Ophthalmic Tuberculosis with a New Tuberculosis Vaccine "AO." B. Nakamura, Osaka, Japan.—p. 161.

Selected Cases Showing Advantages of a Combined Tangent Screen and Perimeter. C. E. Ferree, G. Rand and L. L. Sloan, Baltimore.—p. 166.

Sympathetic Scleritis. B. Samuels, New York.—p. 185.

*Removal of Lid, with Plastic Repair. W. L. Hughes, Hempstead, N. Y.—p. 198.

Roentgen Therapy of Pituitary Tumors: Report of Twenty Cases. C. C. Hare and C. G. Dyke, New York.—p. 202.

New Test for Visual Acuity. F. H. Verhoeff, Boston.—p. 226.

Respective Values of Various Forms of Treatment of Certain Diseases of the Cornea. G. H. Burnham, Toronto, Canada.—p. 231.

*Protein Extract of Vitreous Humor (Bovine): Preliminary Report. C. Hobart, St. Louis.—p. 237.

Ophthalmic Tuberculosis.—Since 1926 Nakamura, in the treatment of ophthalmic tuberculosis, used AO, a tuberculosis vaccine discovered by Arima and Aoyama. He states that 1 cc. of AO number 1, i. e., the smallest dose for adults, administered once a week, nearly always brought about a subsidence of the disease without any noxious result. He believes that ophthalmologists should extend the method of using the optimal dose not only in the treatment of phlyctenae but also in all tuberculous diseases of the eye. He points out that AO has proved to be the best remedy in all forms of ophthalmic tuberculosis as compared with other tuberculins. Of the 503 cases in which accurate observations were made, the conditions subsided in 89.5 per cent, and in 10.5 per cent the conditions remained unchanged. These diseases were tuberculous, were suspected of being tuberculous, were not certain etiologically or defied antisyphilitic treatment. The author concludes that the great advantage of AO is that, used in nonincreasing doses as he has advocated, it never creates unfavorable results.

Removal of Lid.—Hughes removed a tumor that had invaded the inner two thirds of the lower lid with the diathermy cutting current, making the section in the normal tissue. The tumor was thus removed in its entirety without being cut and without the use of forceps. The margin of the free end of the lower lid was denuded for about one-eighth inch (0.3 cm.), and a similar portion of the margin of the upper lid was denuded. A double-armed suture was passed through a rubber pig and through both lids, and this was passed through a second pig and tied, stretching the remaining lateral third of the lower lid. This covered almost all the lower part of the cornea, keeping the remnant of the lower lid from contraction and preserving its normal shape. An adhesion was thus formed between the upper and lower lids at the point of denudation. At the same time a pocket was made in the upper lid, preparatory to the insertion of a piece of mucous membrane from the mouth. A piece of mucous membrane was then removed from the inside of the

cheek and attached to a small metal form with its smooth surface toward the form; later this formed the conjunctiva of the new lower lid. A perforated piece of cellulose acetate to which a small amount of sterile petrolatum was applied was placed directly over the lids and the denuded surface inferiorly. A pressure dressing of gauze fluffs was then applied and left in place for one week. At the first dressing the rubber pigs and the suture were removed, and the pressure dressing was reapplied to remain for five days more. A light dressing, changed every three days, was kept on until three weeks after the operation. The granulation tissue was removed to form a clean bed to receive the graft from the upper lid. The skin of the upper lid, including the part lined by mucous membrane, was then removed. The mucous membrane edge was sutured to the conjunctiva, and the edges of the skin were approximated by fine interrupted black silk sutures (number 00 special ligature braided silk). A pressure dressing consisting of perforated cilkloid moistened with petrolatum was applied directly over the eyelids and graft. The gauze fluffs were held in place with adhesive tape and then pressed firmly down by means of a tight bandage and adhesive tape. A week later a similar dressing was applied for another five days. After that a light dressing was applied until, at the end of three weeks, dressings were dispensed with. The intermarginal adhesion was left intact for six weeks, which allowed full contracture to take place before it was cut. When it was cut, the intermarginal adhesion on the lower lid assumed a relatively normal position.

Protein Extract of Vitreous Humor.—Hobart states that his clinical observations and tests prove that certain persons are hypersensitive to vitreous humor protein and that in such persons a characteristic inflammatory reaction results when a loss of vitreous occurs through injury or operation. Persons with cataracts or any injury of the globe should have an intradermal test with vitreous protein before operation. Persons who are hypersensitive should be desensitized. Following extraction of a cataract with loss of vitreous but with retention of the cortex, a person may be hypersensitive to both proteins. A person hypersensitive to the vitreous protein of the ox or of the pig is also hypersensitive to the protein of his own vitreous. It is possible to sensitize an animal to its own vitreous protein. Regardless of the amount of vitreous lost, some persons have a severe, others a mild and still others no inflammatory reaction. The author hesitates to recommend or suggest the dosage for purposes of desensitization. It will vary according to the patient. It is best to begin with about 1 cc. and gradually to increase the dose to 2 cc. In order to determine whether the patient is desensitized, an intradermal test should be performed.

Colorado Medicine, Denver

30: 277-316 (Aug.) 1933

The Medical and Surgical History of the Appendix Vermiformis. W. W. Grant, Denver.—p. 280.
Surgery of the Upper Abdomen. L. V. Sams, Denver.—p. 287.
Some Clinical Aspects of Tumors of the Breast. Ella Mead, Greeley. —p. 289.
Association of Eczema with Alteration in Gastric Secretions. O. S. Philpott, Denver.—p. 295.
Pneumoperitoneum in Treatment of Tuberculous Peritonitis. O. M. Gilbert, Boulder.—p. 296.

Florida Medical Association Journal, Jacksonville

20: 45-88 (Aug.) 1933

Lymphopathia Venerea. A. Brown, Jacksonville.—p. 53.
Appendicitis: Increase in Mortality Rate and Its Influencing Factors. H. E. White, St. Augustine.—p. 57.
Some Disturbances of Thyroid Gland. H. West, DeLand.—p. 62.
Pyuria in Infants and Children. J. R. Boulware, Jr., Lakeland.—p. 66.
*New Method of Treating Fractures of the Lower Extremity. L. H. Oetjen, Leesburg.—p. 69.

Fractures of Lower Extremity.—Oetjen describes his well leg traction method for treating fractures of the leg. The first cast to be applied is on the well leg and is applied in the usual manner, extending from the midthigh to several inches beyond the toes. The foot should be placed at right angles to the leg and should be held in slight eversion, and care should be taken that the plantar surface of the cast is firmly reinforced so as to support the weight of the counter traction. The ankle of the fractured leg is then prepared in the usual manner. The site of election for the insertion of the Steinman pin is at a point two fingerbreadths above the internal malleolus. The skin and periosteum on each side is infiltrated with a 2 per cent solution of procaine hydrochloride and the pin is inserted without any drilling or preliminary skin incision. Sterile sponges are then placed next to the skin over the ends of the pin. The leg is wrapped with cotton batting and the plaster cast is applied, including the toes and several inches beyond. The traction stirrup is placed over the ends of the pin and the stirrup incorporated in the cast with plaster bandage. After the plaster has firmly set, the splint is bolted together and the traction nut screwed down and correct alinement of the fragments is obtained by either internal or external rotation of the fractured leg. In general the author's time for the removal of the pin is: fractures of the pelvis, from four to six weeks; fractures of the neck of the femur, from twelve to fourteen weeks; intertrochanteric fractures, from seven to nine weeks; subtrochanteric fractures, from seven to ten weeks; fractures of the femoral shaft, from five to ten weeks; fractures of the distal third, from five to ten weeks; fractures of the tibia, from four to twelve weeks, and operative cases, from six to eighteen weeks.

Journal of Bacteriology, Baltimore

26: 139-228 (Aug.) 1933

Influence of Foodstuffs on Respiratory Metabolism and Growth of Human Tubercle Bacilli. R. O. Loebel, E. Shorr and H. B. Richardson, with technical assistance of Muriel Harris, New York.—p. 139.
Influence of Adverse Conditions on Respiratory Metabolism and Growth of Human Tubercle Bacilli. R. O. Loebel, E. Shorr and H. B. Richardson, with technical assistance of Muriel Harris, New York.—p. 167.
Nature of Effect of Carbon Dioxide Under Pressure on Bacteria. J. S. Swearingen and I. M. Lewis, Austin, Texas.—p. 201.
Gram Reaction and Electric Charge of Bacteria. V. Burke and F. O. Gibson, Pullman, Wash.—p. 211.
Studies on Solubility of Pneumococcus in Saponin: II. Sensitization by Ergosterol. S. J. Klein, New York.—p. 215.
Systematic Relationships of Actinobacillus. L. Thompson, Rochester, Minn.—p. 221.

Journal of Pediatrics, St. Louis

3: 265-406 (Aug.) 1933

X-Ray Shadows in Growing Bones Produced by Lead: Their Characteristics, Cause, Anatomic Counterpart in the Bone and Differentiation. E. A. Park, D. Jackson, T. C. Goodwin and L. Kajdi, Baltimore.—p. 265.
*Alimentary Intoxication in Infants: Acid-Base Equilibrium with the Use of Continuous Intravenous Therapy (Preliminary Report). H. Cohen, P. R. Miller and B. Kramer, Brooklyn.—p. 299.
Dilatation and Hypertrophy of the Heart in Infancy Due to Parenchymatous Myocarditis. F. E. Kenny and S. Sanes, Buffalo.—p. 321.
Present Status of Serum Treatment in Acute Poliomyelitis. C. Wesselhoeft, Boston.—p. 330.
*Pseudohypertrophic Muscular Dystrophy: Preliminary Report on Treatment of Three Cases with Glycine. H. B. Mettel and Y. K. Slocum, Indianapolis.—p. 352.
Epilepsy: Value of Encephalography in Selection of Patients for Treatment by Ketogenic Diet. R. C. Eley, Boston.—p. 359.
Blood Picture in Early Stages of Pertussis. Vera B. Dolgopol, New York.—p. 367.

Alimentary Intoxication in Infants.—Cohen and his associates treated nine cases of alimentary intoxication with the continuous intravenous drip and starvation in an attempt to correct dehydration, to reestablish diuresis and to restore the chemical equilibrium of the blood serum. They found the administration of dextrose and saline solution by continuous intravenous drip to be a reasonably safe procedure. Dehydration is rapidly corrected and diuresis reestablished. Adjustment of inorganic equilibrium of the blood may require several days. Clinical improvement usually precedes chemical readjustment. Diarrheal acidosis in their cases was due either to a relative or an absolute increase in the chloride or to a decrease in fixed base in agreement with previous observation. Increase of nonprotein nitrogen disappeared promptly with the reestablishment of diuresis. The authors draw no final conclusions as to the therapeutic value of this method of administration, because of an insufficient number of cases. The amount of fluid required to overcome dehydration would seem to be less than when other channels of administration are used. There is real danger of producing edema because of rapid blood dilution.

Pseudohypertrophic Muscular Dystrophy.—Mettel and Slocum confirm the work of Milhorat, Technor and Thomas, who have shown that patients presenting pseudohypertrophic muscular dystrophy show a creatinuria, even when maintained on a creatine-free diet. The normal subject excretes ingested

creatine almost quantitatively (from 65 to 100 per cent). The inability to retain ingested creatine is said to be in proportion to the severity of the disease. The authors present the case histories of three patients suffering from pseudohypertrophic muscular dystrophy who were treated with glycine. An earlier report showed that the daily ingestion of 5 Gm. of glycine was followed by a definite rise in the creatinuria. The daily administration of from 15 to 20 Gm. of glycine increased the daily excretion of creatine to from 300 to 500 mg. After a period of some weeks (depending on how advanced was the case), the creatinuria begins to decrease despite the continuance of glycine, until it falls to the former control level. Coincident with the increase in creatinuria there is an improvement in the patient's ability to hold ingested creatine. These changes in the metabolism disappear in the course of a few weeks after the cessation of glycine ingestion and return if the administration is again instituted. The first symptoms of improvement are manifested by a curious feeling in the muscles which the patients described as a crawling, rumbling sensation. Following this there is a disappearance of the sensation of fatigue. Gradually the function of the involved group of muscles is so improved that activity can be performed which had been impossible before the administration of this drug. Two of the patients so treated showed improvement; the other one showed slight improvement.

Journal of Urology, Baltimore

30: 153-270 (Aug.) 1933

Tuberculous Nephritis and Tuberculous Bacilluria: Study of One Thousand Operated Cases of Renal Tuberculosis: Pathology and Bacteriology. F. Lieberthal, Chicago, and T. Hüth, Budapest, Hungary.—p. 153.
Mechanism of Perinephric and Perinephritic Abscesses: Clinical and Pathologic Study. V. Vermooten, New Haven, Conn.—p. 181.
*Routine Cultures of Urine for Tubercle Bacilli. L. R. Seidman, Baltimore.—p. 193.
Perforation of Urinary Bladder by Pelvic Abscess: Report of Two Cases. D. P. Fagerstrom, San Jose, Calif.—p. 207.
Study of Response of Trigon and Detrusor Musculature to Vesical Neck Obstructions. M. Muschat, Philadelphia.—p. 221.
Direct Internal Ultraviolet Radiation to Entire Genito-Urinary System. S. Lubash, New York.—p. 231.
Papillary Carcinoma of Bladder and Horseshoe Kidney Occurring Simultaneously in the Same Individual. E. Floyd and J. L. Pittman, Atlanta, Ga.—p. 239.
Caudal Anesthesia in Children. M. F. Campbell, New York.—p. 245.
*Sodium Citrate Solution for Preventing Formation of Blood Clots in the Bladder. A. M. McLellan, New York.—p. 251.
Transurethral Removal of Prostatic Stones with Simultaneous Revision of Prostate: Report of Case. L. L. Michel, New York.—p. 253.
Calcified Cyst of Spermatic Cord: Case Report. G. C. Burr, Detroit.—p. 259.
*Diphtheritic Urethritis. N. E. Berry, Kingston, Ont., Canada.—p. 263.

Cultures of Urine for Tubercle Bacilli.—Seidman took cultures of eighty-nine tuberculous specimens, from forty-five patients, eighty-one of which were either bladder or kidney urine. Tubercle bacilli were isolated from sixty, or 67.4 per cent, of the specimens, and from thirty-nine, or 86.6 per cent, of the patients. In fourteen of the positive cultures, no acid fast bacilli had been seen in the direct smear of the concentrated sediment. From fourteen specimens, in which acid fast bacilli had been seen in the direct smear, no growth was obtained. In fifteen specimens, in which both culture and direct smear were negative, the inoculated guinea-pigs developed tuberculosis. Growth of tubercle bacilli was obtained on Corper's crystal violet potato cylinder from 54 per cent of the positive sediments, on Petroff's coagulated egg medium (without gentian violet) from 69.1 per cent, and on Sweany's milk meat infusion, egg and cream medium from 71.6 per cent. Oxalic acid, 5 per cent, and sodium hydroxide, 3 per cent, proved better as digestants than a 6 per cent solution of sulphuric acid, both in the percentage of isolations and in the average time required for the appearance of growth. All three reagents were equally efficient in destroying secondary contaminants. The shortest interval for the primary isolation of tubercle bacilli by culture was sixteen days. Growth was obtained within three weeks in 18.3 per cent of the positive specimens, on 7 per cent of the inoculated culture tubes. For the reasons discussed, guinea-pig inoculation still appears to be superior to cultures for the diagnosis of tuberculosis in suspected cases. No avian strains of tubercle bacilli were recovered. Strains from eighteen cases were of the human type, and the remainder showed the growth characters of the mammalian organisms.

Prevention of Blood Clots in Bladder.—During 1932, in the course of investigations directed toward satisfactory suture of the bladder neck during suprapubic prostatectomy, McLellan felt that the problem could be greatly simplified by the use of some solution that would prevent the formation of blood clots in the bladder. Sodium citrate solution immediately suggested itself. Since that time the author has used the 3 per cent solution of sodium citrate as a routine in forty-three operations for enlargement of the prostate; viz., twenty suprapubic prostatectomies with closure of the bladder neck, nineteen resections of the prostate under vision, and four Caulk cautery punch operations. During prostatectomy the solution is injected into the bladder as soon as the bladder neck has been sutured. Approximately 25 cc. is left in the bladder until the suprapubic wound has been properly closed; then this solution is washed out and replaced by about 25 cc. more and the tube clamped while the patient is taken to his bed for permanent drainage under low decompression. If the outflow is bloody, the citrate solution may be changed again several times during the first few hours. The author states that the use of this solution has completely eliminated the formation of clots and the plugging of the catheter by such clots in every instance. All clots must be removed from the bladder before the citrate solution is injected, as it may not disorganize rapidly any clots that are already formed.

Diphtheritic Urethritis.—Berry reports a case of diphtheritic urethritis in a man, aged 45, who complained of frequent painful urination with two attacks of retention. The condition had been present for about three weeks, and just prior to its onset he had had a left "ureteral colic" and passed a calculus the size of a shriveled grain of wheat. Hot sitz baths and sedatives were prescribed and the patient was instructed to return in a week. He returned in five days with a temperature of 101 F. and a pulse of 100. There was marked edema of the penis, which was red and painful. The membrane appeared exactly as before. Bacteriologic investigation finally revealed a true diphtheria bacillus. Antitoxin was administered: 15,000 units during the first week and 5,000 each for two following weeks. The membrane, which had been densely adherent for nearly a month, began to loosen the morning after the first injection and came away in large pieces in the urine. In three days the normal urethral mucosa could be seen shining through and pieces of membrane could be picked off with forceps, though it was still adherent and left a bleeding surface. In ten days the urethra was clear of membrane, though the mucosa was inflamed and remained so for weeks. The areas of induration about the urethra eventually went on to suppuration and required incision. They finally healed completely. One year from the original onset of his illness, he returned with a condition similar to that of the previous year. Culture showed the same organism as before. Antitoxin was again administered in doses of 5,000 units without benefit and the dosage was increased to 15,000 units, but still the disease progressed. The meatus became widely eroded and the membrane extended to the frenum, which was destroyed. A large periurethral abscess again formed at the penoscrotal junction; it opened widely and through it the greater part of the urine found exit. In view of the fact that cultures had always shown the same diphtheria-like organisms, 40,000 units of antitoxin was administered. The patient had a chill and a marked febrile reaction, with immediate improvement in his condition. The antitoxin was repeated at intervals of five days for three weeks and he now appeared well; all the areas of ulceration were healed, though the periurethral fistula was still discharging. After the second dose of antitoxin a cystoscope was passed in order to dilate the urethra and to ascertain the extent of the involvement. This showed the condition to be limited to the anterior urethra; the posterior urethra and the bladder were entirely normal and the urine from each ureter was sterile. The author concluded from microscopic and cultural studies that the organism was a diphtheria bacillus, although the negative virulence tests as well as the sugar reactions pointed toward an organism of the Xerosis group. The organism described in Sewell's case of chronic cavernitis resembled this organism in some respects but differed in that it was actively pathogenic for mice.

New England Journal of Medicine, Boston

209: 219-266 (Aug. 3) 1933

Obstruction of Lower End of Ureter Following Certain Bladder Operations. A. L. Chute, Boston.—p. 219.
Pneumococcus Lobar Pneumonia. D. O'Hara, Boston.—p. 222.
A Room-Sized Respirator. P. Drinker and J. L. Wilson, Boston.—p. 227.
Urinary Tract Complications from Uterine Cancer. F. H. Colby, Boston.—p. 231.
Erythema Nodosum-Like Lesions in Chronic Ulcerative Colitis: Report of Case. P. A. Brooke, Worcester, Mass.—p. 233.
Primary Torsion of the Great Omentum. L. Allen, Burlington, Vt.—p. 235.
Ulceration of Duodenum from Actinomycotic Infection. L. Rabinowitz, Waltham, Mass.—p. 236.
Menstrual Pain Among Industrial Women. Mary R. Lakeman, Boston.—p. 237.
Physical Diagnosis Prior to Auenbrugger. R. W. Buck, Boston.—p. 239.
*Insulin Therapy in Postpellagrous Trophic Ulcers. Elizabeth Ann Sullivan, Cambridge, Mass.—p. 241.
Brodie's Abscess of a Spinous Process. H. R. Wheat and L. E. Hathaway, Jr., Springfield, Mass.—p. 243.
Subcutaneous Emphysema Complicating Parturition: Report of Case. J. A. Maroney, Worcester, Mass.—p. 245.

209: 267-318 (Aug. 10) 1933

Circulatory Disturbances of Extremities: Medical Aspects. Soma Weiss, Boston.—p. 267.
Scarlet Fever Outbreak Due to Raw Milk. R. F. Feemster and J. M. Kingston, Boston.—p. 275.
Industrial Poisons. Alice Hamilton, Boston.—p. 279.
Benign and Malignant Tumors of the Lung, Bronchi and Mediastinum. D. S. King, Boston.—p. 282.

Insulin in Postpellagrous Trophic Ulcers.—Sullivan reports a case in which trophic ulcers occurred following pellagra, and insulin was given to improve nutrition and thereby to hasten the reparative processes in the trophic ulcers. The trophic ulcers were the last manifestation of a fulminating pellagra of a duration of four months and appeared after the subsidence of severe cutaneous, gastro-intestinal and neurologic symptoms. The pellagra had been treated by a diet rich in vitamin G and by local and general therapy for lesions and symptoms. Three months after the onset of the pellagra and after the disappearance of the pathognomonic signs, the first group of bilateral, symmetrical trophic ulcers appeared on the feet. This first set of ulcers, which healed in eight weeks, was treated, in addition to the dietary measures, by protective and antipruritic ointments and other medicaments. Two weeks later a second set of symmetrical lesions more severe and diffuse appeared on new sites on the feet and lower parts of the lower extremities. Notwithstanding energetic dietary and local treatment for six weeks this second set of ulcers enlarged, the feet became indurated and inflamed and the patient steadily lost appetite and weight. Insulin was then started and in two weeks the induration of the feet had gone and the ulcers healed; the appetite returned, the weight increased and the paresthesias of the toes disappeared.

Northwest Medicine, Seattle

32: 311-356 (Aug.) 1933

Acute Infective Osteomyelitis. A. T. Bazin, Montreal, Que.—p. 311.
Grading of Malignancies. D. L. Martin, Tacoma, Wash.—p. 316.
Malignant Disease of Esophagus: Study of One Thousand Cases. P. P. Vinson, Rochester, Minn.—p. 320.
Cancer of the Stomach. J. E. Else and O. Schneider, Portland, Ore.—p. 323.
Cancer of Colon and Rectum: Its Diagnosis and Treatment. T. E. Jones, Cleveland.—p. 326.
Agranulocytic Angina: A Pitfall in Its Recognition and Comments on Recent Advances in Its Treatment. E. S. Du Bray, San Francisco.—p. 331.
Treatment of Agranulocytic Angina with Nucleotide K 96. F. Brugman and E. J. Lewis, Seattle.—p. 336.
Neuropsychiatry Applied to Urology. F. J. Clancy, Seattle.—p. 338.
Congenital Deformities and Anomalies. H. A. Dowd, Salem, Ore.—p. 342.
Hemorrhagic Encephalitis: Arsenical. J. G. Strohm, Portland, Ore.—p. 347.

Oklahoma State Medical Assn. Journal, Muskogee

26: 273-314 (Aug.) 1933

Diagnosis of Diabetes Mellitus: Significance of Glycosuria. G. L. Driver, Ponca City.—p. 273.
Diabetes in Childhood. L. A. Riely, Oklahoma City.—p. 279.
Diabetes Mellitus and Its Relation to Vascular Disease. H. A. Ruprecht, Tulsa.—p. 284.
Dieting the Medical and Surgical Ulcer Patient. S. Harris, Birmingham, Ala.—p. 287.

Pennsylvania Medical Journal, Harrisburg

36: 815-894 (Aug.) 1933

Progress in Prostatic Surgery. J. F. McCarthy, New York.—p. 815.
Purulent Conjunctivitis in Infants: Caused by an Atypical Staphylococcus. J. S. Plumer, Pittsburgh.—p. 821.
Results in Surgical Treatment of Pulmonary Tuberculosis. C. H. Marcy and H. R. Decker, Pittsburgh.—p. 824.
Thermic Treatment of Neurosyphilis. S. B. Haddon and G. Wilson, Philadelphia.—p. 829.
Treatment of Congenital Syphilis. C. S. Wright, Philadelphia.—p. 832.
Aplastic Anemia; Paralytic Anemia; Aregeneratory Anemia; Myelophthisis. W. M. Bortz, Greensburg.—p. 834.
Blood Stream Infection Delaying Healing in Simple Fracture. F. S. Mainzer, Clearfield.—p. 838.
Tumor of the Kidney. T. C. Stellwagen, Philadelphia.—p. 839.
Id.: Roentgen Diagnosis of Tumor of the Kidney. G. W. Grier, Pittsburgh.—p. 842.
An Unusual Renal Anomaly. P. P. Mayock, Wilkes-Barre.—p. 844.

Southern Medical Journal, Birmingham, Ala.

26: 665-752 (Aug.) 1933

Clinical-Pathologic Conference: I. Case of Severe Anemia with Cardiac Manifestations; II. Case of Obscure Infection. L. Hamman, Baltimore.—p. 665.
*Operation for Late Reduction of Semilunar Bone. E. D. McBride, Oklahoma City.—p. 672.
Denervation of Ureter: Clinical Study. L. R. Wharton, Baltimore.—p. 677.
Pulmonary Abscess in Children. D. T. Smith and A. McBryde, Durham, N. C.—p. 686.
Plasma Cell Myelomas Causing Cord Compression: Report of Five Cases. R. M. Klemme, St. Louis.—p. 692.
Asthmatic Bronchitis: Treatment with Iodized Oil (Lipiodol). J. F. Alison, Selma, Ala.—p. 696.
Studies on Metabolism and Results of Treatment in Various Forms of Arthritis. L. Martin, Baltimore.—p. 699.
Endemic Nutritional Edema in Tennessee: Public Health Problem. J. B. Youmans, Nashville, Tenn.—p. 713.
Peptic Ulcer in the Southeast: Clinical Study of One Hundred and Eighty Cases. J. B. Fitts, Atlanta, Ga.—p. 718.
Trend of Cases of Syphilis Under Treatment or Observation in the United States. T. Clark and Lida J. Usilton, Washington, D. C.—p. 722.
Ocular Neuropathies and Amauroses in Meningococcic Meningitis. P. M. Lewis, Memphis, Tenn.—p. 729.
Adjustable Shoulder for Paracentesis Needle. E. Lewis, Washington, D. C.—p. 734.
Abortions. W. T. McConnell, Louisville, Ky.—p. 734.
Periodic Examinations. W. N. Blount, Laurel, Miss.—p. 740.

Reduction of Semilunar Bone.—McBride's procedure consists of firmly anchoring the dorsal horn of the semilunar bone to the radius, thus restoring the effect of the dorsal ligament. When secured in this manner, the bone is in an attitude of complete dorsiflexion, which prevents it from slipping partially forward. The author believes that the success of an operation for late reduction depends on complete freedom of the ligamentous contraction and fibrous tissue attachments of the anterior horn to the radius, the complete removal of fibrous tissue in the cavity formerly occupied by the semilunar bone, and of abnormal attachments of the os magnum, and the security of the semilunar bone in its normal articular bed, so that it cannot slip or rotate forward. In performing the operation, an incision about 1½ inches long is made on the dorsum of the hand, immediately to the ulnar side of the extensor carpi radialis. The vein and nerve, together with the extensor indicis tendon, are retracted to the ulnar side and the extensor carpi radialis to the radial side. The fibrous tissue in the bed formerly occupied by the semilunar bone is excavated and a smooth curved periosteal elevator is passed forward to free the anterior horn contraction from the radius. The bone, which lies in a plane entirely anterior to the carpal bones, is then pried into position by a Davis skid or a similar instrument. If it cannot be reduced without too much trauma, it is better to make an anterior incision immediately to the ulnar side of the palmaris longus, with its center over the radiocarpal articulation. The group of flexor profundus tendons is retracted to the ulnar side and the median nerve and palmaris longus tendon are retracted to the radial side. Complete reduction may be recognized by the contour of the dorsal horn. If the bone has a tendency to pull forward or is not entirely in alinement with the transverse plane of the wrist, the anterior ligament is not entirely free, in which case a crevice is made in the anterior face of the dorsal horn of the semilunar bone with a curet, creating a hook into which a strand of number 00 plain catgut is inserted and sutured to the dorsum of the radius. The semilunar bone is thus checked in full dorsiflexion to the radius.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Anaesthesia, Manchester

10: 91-142 (April) 1933

Anesthetic Sequelae: Their Recognition, Cause and Prevention. J. Halton.—p. 91.
Anesthetic Mortality. W. S. Sykes.—p. 98.
Quartet of Semiautomatic Anesthetic Apparatus. P. A. Mansfield.—p. 102.
*Successful Treatment for Toxic Symptoms from Ether Anesthesia: Based on Biochemical Investigation. R. J. Minnitt.—p. 106.
Nervous Sequelae of Spinal Anesthesia. H. K. Ashworth.—p. 127.

Toxic Symptoms from Ether Anesthesia.—Minnitt conducted an investigation in an endeavor to find a solution for some of the mysterious problems in connection with operative procedures under ether anesthesia and to suggest a successful method of treatment. He observed that the blood sugar rises and the blood pressure falls as ether anesthesia progresses and that the blood sugar is high and the blood pressure is low when symptoms of shock are present. He believes that there is some justification for thinking that the pancreatic hormone is deficient as the result of the ketosis produced in connection with ether anesthesia. He found that the administration of insulin is a successful method of treatment for postanesthetic toxic symptoms, which are always associated with a high blood sugar; that it prevents these from developing; that, on the conclusion of the operation, it eliminates the injurious effects of ether anesthesia, and that during the operation, when symptoms of shock appear, and immediately before and after anesthesia, it acts as a preventive against the development of toxic symptoms.

British Medical Journal, London

2: 223-274 (Aug. 5) 1933

Essential Vascular Hypertension. H. Rolleston.—p. 223.
Fields of Vision in Connection with Intracranial Lesions. A. A. McConnell.—p. 226.
Fields of Vision in Intracranial Lesions. H. M. Traquair.—p. 229.
Vitamins in Practical Experience: Note. L. J. Harris.—p. 231.
*Unusually High Eosinophilia of Obscure Origin: Case. J. Murphy.—p. 233.
Oral Administration of Nembutal as Preanesthetic Medication. F. F. Waddy.—p. 234.
Report on Use of Chloroform Capsules During Labor. A. Rees.—p. 241.

Eosinophilia of Obscure Origin.—Murphy presents a case of high eosinophilia of obscure origin with interesting clinical features. There was a definite absence of tapeworm and no history of the eating of raw pork, no signs of trichinosis and nothing in the history to suggest ancylostomiasis. The patient was given 30 grains (2 Gm.) of thymol in three successive doses, with negative results. There were no symptoms of filarial infection, no localized tumor, a hydatid thrill could not be elicited in the liver, and a negative complement fixation test for echinococcus eliminated the possibility of a hydatid cyst being embedded deeply in the liver substance. Cancer of the liver could be ruled out in view of the patient's improved condition, the absence of jaundice and of any cachectic signs, and the smoothness of the liver surface. The Wassermann test was negative and there was no history of gonorrhea. The patient never had asthma, skin disease or pediculosis. The patient's excellent family history negated the possibility of inherited eosinophilia. Blood cultures, the examination for malarial parasites, the various agglutination reactions for enteric and Alcaligenes groups all were negative. The one definite thing is that he tends to get worse when not taking liver in some form. Even with active liver treatment his red blood count is only about 3,400,000 per cubic millimeter. It is unlikely that the condition is one of the so-called eosinophil leukemias, as the total leukocyte count is relatively low. The author regards this case as one of pernicious anemia with an extraordinarily high eosinophil count.

East African Medical Journal, Nairobi

10: 99-128 (July) 1933

Forefathers of Tropical Medicine. H. J. O. Burke-Gaffney.—p. 100.
Lymphogranuloma Inguinale in African Natives: Three Cases. J. W. Graham.—p. 115.
Poisoning with Male Fern: Two Fatal Cases. T. F. Anderson and J. C. D. Carothers.—p. 122.

Indian Medical Gazette, Calcutta

68: 365-424 (July) 1933

Dermographia with Short Note on Etiology of Condition: Case. H. W. Acton and Dharmendra.—p. 365.
Morphine Habit in India. R. N. Chopra and G. S. Chopra.—p. 368.
Some Factors Regulating Metastasis in Carcinoma and Their Influence on Prognosis. M. N. De and S. C. Sinha.—p. 371.
*Mixed Tumor of the Face, Not Associated with the Parotid Gland. P. N. Ray.—p. 373.
Pantocaine in Eye Surgery. G. J. Gnanadickam.—p. 376.
Frequency of Hydatid Disease in India. P. A. Maplestone.—p. 377.
Pellagra in Hyderabad Deccan: Further Notes. J. Lowe.—p. 379.
Pellagra in Guntur. T. K. Raman.—p. 381.
Incidence of Arsenical Dermatitis. H. K. Chakravarty.—p. 383.
Plea for Collapse Therapy in Early Stages of Pulmonary Tuberculosis. P. T. Patel.—p. 385.
Few Observations on Pharmacology and Therapeutics of Muscle Extract. P. Ganguli.—p. 387.
Serologic Proof of Ethnologic Identity of Hindus and Mohammedans of Assam. P. N. Mitra, with comments by H. P. Chaudhuri.—p. 393.

Mixed Tumor of the Face.—Ray describes a mixed tumor of the face unconnected with the parotid gland, the greater part of which was composed of a large single translucent cyst containing a clear yellow fluid. Basal cells were present and some of the smaller cysts were lined by basal cells. It is known that the mixed tumor may take the form of a basal cell tumor or of adenoid cystic epithelioma. But when the cell masses are more compact, the cells tend to assume a somewhat irregular form. Histologically, the tumor has to be differentiated from endothelioma. Every unusual tumor that lacks easily recognizable characters stands an excellent chance of being labeled endothelioma. Further, atypical endothelioma can scarcely be regarded as having an established position. In the author's case there was a tendency to cylinder formation, but it is a peculiarity seen in other tumors besides cylindroma. The diagnosis of atypical endothelioma is admittedly difficult. Kettle has laid down the rule that the negative properties of a cell cannot demonstrate its origin, and it is only when the cells of a neoplasm present positive evidence of their endothelial nature that one is justified in calling the tumor an endothelioma. The formation of the cystic spaces is due to degeneration of the stroma or they are the result of desquamation or of the secretory activity of the cells of the neoplasm. There is no doubt that the varied natures of the component cells and the supporting stroma are readily explained, if the tumor is regarded as an "enclavoma" of embryonic origin. The new growth was therefore diagnosed as a mixed tumor of the parotid region, of the extraglandular variety.

Irish Journal of Medical Science, Dublin

No. 91: 281-328 (July) 1933

Foundation of a Great Hospital: Steevens in the Eighteenth Century. T. P. C. Kirkpatrick.—p. 281.
Hypnotics and Preanesthetic Sedatives. A. R. Parsons.—p. 304.
Strangulation of Ileum Through Congenital Opening in Mesentery. H. Meade.—p. 311.

Journal Obst. and Gynec. of Brit. Empire, Manchester

40: 749-956 (Aug.) 1933

Hysterectomy, Subtotal and Total: Review of Mortality and Morbidity of Subtotal and Total Operations on Series of Two Thousand Three Hundred and Forty-Four Consecutive Cases at the Chelsea Hospital for Women in the Ten-Year Period 1922-1931 Inclusive. C. D. Read and A. C. Bell.—p. 749.
Carcinoma of the Body of the Uterus: Study of Fifty Cases. J. Beattie.—p. 768.
The Menarche and Menstrual Type: Notes on Ten Thousand Case Records. W. Kennedy.—p. 792.
Pathology of Ovarian Tumors: Part V. W. Shaw.—p. 805.
Ovarian Pregnancy: Description of Case. W. Clement.—p. 822.
*Radium Treatment of Nonmalignant Uterine Hemorrhage. Phyllis Epps.—p. 835.
Postpartum Eclampsia: Two Cases. R. H. Paramore.—p. 843.
Investigation on Dry Labor. A. H. M. J. Van Rooy.—p. 850.
Placenta Accreta: Case. B. Solomons.—p. 855.
Maneuver for Correcting Posterior Parietal Presentation of the Child So as to Permit of Successful Delivery with Forceps. R. A. Lennie.—p. 859.

Treatment of Uterine Hemorrhage.—Epps treated 141 patients for excessive uterine hemorrhage with radium. In the majority of instances the hemorrhage was not due to any demonstrable lesion, and in no case due to cancer. With the patient under anesthesia, the length of the uterine cavity was measured by a graduated sound, and a dilation and diagnostic curettage were performed. Either 50 mg. or 30 mg. of radon

in a small uterus, screened by 1 mm. of platinum and 1.5 mm. of rubber, was inserted into the uterus. The rubber tube, which had been cut to correspond with the uterine length, was stitched so that an empty cuff remained in the cervical canal, the radium occupying only the uterine body. The vagina was packed with gauze wrung out in 1:2,000 solution of acriflavine hydrochloride in physiologic solution of sodium chloride. The dosage was adjusted by the length of time the radium was in place. Complications did not follow the use of radium in this series, and the patients were discharged from five to seven days after treatment, unless they were anemic. For the treatment of menopausal hemorrhage, radium is practically a specific. From this series the author concluded that a dose of 1,100 millicurie hours is satisfactory and should rarely be exceeded. In younger women, cancer being excluded, a longer trial of medical treatment should be given. Should this fail, radium is indicated before hysterectomy is considered. The minimum effective dose is advisable, in order to avoid the possibility of a premature climacteric or, if pregnancy should follow, complications of labor. Such a dose is probably 300 millicurie hours during adolescence, and from 500 to 700 millicurie hours during the child bearing age. If attention is paid to the details of the technic, stenosis of the cervix and the upper part of the vagina should not occur. Sufficient time (up to six months) should elapse after treatment before its efficacy can be judged. If the condition of the patient is grave, an earlier second dose may be necessary. The use of small doses should avoid the appearance of menopausal symptoms in the young or their accentuation in the older woman. A small dose, repeated if necessary, is preferable to overdosage. Seventeen cases of uterine hemorrhage were associated with fibroids, which were small and for the most part discovered only after examination under anesthesia; a dose of from 1,100 to 1,200 millicurie hours was satisfactory in fifteen cases.

Correcting Posterior Parietal Presentation of Child.—Lennie believes that a corrected posterior parietal presentation can be maintained in its new position if the fundus of the uterus is drawn upward and forward by abdominal manipulation. By this means the body of the child is brought away from the maternal spine, thereby correcting the obtuse angle between the body and head of the child. The maneuver consists of altering the posterior parietal position into that of an anterior parietal, by pushing the sagittal suture, facilitated by a fold of the scalp, backward toward the sacral promontory. When this is accomplished, the head is steadied in its corrected position, while an assistant passes his hands deeply behind the fundus and raises the uterus upward and forward. Forceps are then applied without the retaining hand being removed from the vagina, and delivery is often successfully accomplished after previous attempts with the forceps have failed. By this maneuver delivery of a live child has been made possible on many occasions when previous attempts at delivery by forceps had failed and craniotomy was advocated as the only possible line of treatment. The maneuver can be demonstrated in the living subject before delivery. When the position of the head has been corrected, it will be noted that the act of raising the fundus upward fixes the head firmly in its new position.

Lancet, London

2: 279-334 (Aug. 5) 1933

*Bilious Migraine: Its Treatment with Bile Salt Preparations. T. C. Hunt.—p. 279.
Some Special Uses of Radon Seeds. H. S. Souttar.—p. 285.
Nocardial (Streptothrix) Organism in Four Recent Cases of Acholuric Jaundice. A. G. Gibson.—p. 287.
Lymphogranuloma Inguinale (Poradenitis Nostras) with Observations on Primary Lesions. T. Anwyl-Davies and A. J. King, with note on pathologic observations by G. M. Findlay.—p. 289.
Intestinal Obstruction Due to Bands in Ileocecal Region. J. E. Eadham.—p. 290.

Bilious Migraine.—Hunt analyzes sixty cases of migraine, forty of which were of the bilious type. Investigation by biliary drainage and oral cholecystography showed some evidence of gallbladder or hepatic disorder in seventeen of twenty-seven selected "bilious" cases. A higher proportion of migraine patients as a whole show evidence of gallbladder disorder than normal subjects. Evidence of stasis in the gallbladder was found in seven of twenty-seven patients examined by biliary drainage. Local gallbladder disease or dysfunction is not a cause of migraine but may occur as the result of repeated migraine attacks or of some primary underlying hepatic or constitutional cause. Cholecystectomy had no effect in relieving migraine attacks in five of six patients. The author emphasizes the importance of inquiry for migraine attacks in subjects of gallbladder disease and its bearing on the results of cholecystectomy. He records the results of treatment by bile salt preparations by mouth in twenty-two selected patients, nineteen of whom were improved, and suggests that some hepatic dysfunction may be a cause of migraine attacks in certain cases; this is supported by the results of bile salt treatment. Epinephrine given subcutaneously is capable of aborting migraine attacks in a high proportion of cases. The usual dose has been 10 minims (0.6 cc.) of the 1:1,000 solution, but 15 or 20 minims (1 or 1.3 cc.) has sometimes been given, in which case it was injected slowly. Of fourteen attacks (nine patients treated), ten have been completely aborted, three definitely ameliorated and one unaffected. The later the injection is given the larger it should be, but the less effective is its action. Although migraine is regarded as allergic in origin, perhaps akin to a cerebral angioneurotic edema, little mention appears of the use of epinephrine in its treatment. The fact that in certain cases it is capable of checking the migraine attack suggests that some vasodilatation rather than a vasoconstriction of the cerebral vessels may be at fault, though any direct effect of epinephrine on these vessels is uncertain, and of course the possibility of suggestion cannot entirely be excluded. The few opportunities that the author has had of treating the actual attacks with epinephrine make him feel that its effect may be as beneficial as in asthma, provided a sufficient dosage is employed.

Medical Journal of Australia, Sydney

2: 167-196 (Aug. 5) 1933

Hospital Policy in Western Australia. D. Smith.—p. 167.
Chronic Hoarseness: Its Clinical Significance, Diagnosis and Treatment. H. Tilley.—p. 169.
Certain Etiologic Factors of Asthma and Their Influence on Treatment. A. J. Collins.—p. 174.
Some Thoracic Problems in Surgery. H. S. Stacy.—p. 179.

Practitioner, London

131: 117-220 (Aug.) 1933

Tropical Liver, Hepatitis and Abscess. L. Rogers.—p. 117.
Malaria and Its Effects. P. Manson-Bahr.—p. 124.
Treatment of Tropical Intestinal Diseases. G. C. Low.—p. 136.
Diagnosis and Treatment of Typhoid Fever. C. E. Lakin.—p. 146.
Tropical Debility. R. M. Carter.—p. 159.
*Routine Treatment of Asthma. A. T. Todd.—p. 168.
Nasal Factor in Asthma, with Especial Relation to Ethmoid Pack Therapy. J. A. James.—p. 183.
*Chronic Colibacillemia, Hypercholesterolemia and Cholelithiasis. P. Desgeorges.—p. 192.
Thrombophlebitis Migrans. H. Douglas-Wilson and S. Miller.—p. 204.

Treatment of Asthma.—Todd recommends that, in the routine treatment of asthma, errors of diet, dentition and bedroom hygiene should be corrected. Continued sensitization of the bronchial mucosa from the ethmoid zone should be prevented by conservative surgery if necessary and the ethmoid pack should be repeated periodically. The antiallergen should be desensitized or saturated by prolonged parenteral injection of the fecal vaccine. A small dose of thyroid extract should be administered daily. The patient should be permitted to have caffeine with the addition of ephedrine, to take at the first sign of an asthmatic attack. Alkalosis, hypocalcemia and vagotonia should be corrected by the prolonged administration of a mixture of calcium chloride, to which the appropriate dose of tincture of belladonna has been added.

Chronic Colibacillemia.—Desgeorges states that hemic infection of the gallbladder with Bacillus coli derived from the intestine is the chief factor in the causation of cholelithiasis. Colon bacilli in the blood are eliminated in both the urine and the bile. Colibacillemia invariably reacts on the liver and bile ducts, causes hypercholesterolemia and, from its frequency, is one of the chief causes of this condition. Most patients with gallstones have or have had colibaciluria, and most of the subjects of chronic colibacillemia eventually suffer from cholecystitis and biliary lithiasis. The best available prophylactic

measure as regards cholelithiasis is to prevent the passage of the colon bacillus from the intestine into the circulation and is one of the first steps to be taken in the treatment. The hypothesis of colibacillemia of intestinal origin throws light on the whole subject of biliary lithiasis and explains the chief clinical and experimental data underlying previous hypotheses of the pathogenesis of this disease.

Presse Médicale, Paris

41: 1561-1584 (Oct. 11) 1933

Subpatellar Rupture of Femoral Quadriceps. C. Lenormant and C. Olivier.—p. 1561.
*Avoiding Postoperative Accidents Accompanied by Hyperazotemia and Hyperchloremia. M. Robineau and M. Lévy.—p. 1565.
Antidiphtheritic Serum Therapy. R.-A. Marquezy, A. Bourdin and Mlle. D. Renget.—p. 1568.

Postoperative Accidents Accompanied by Hyperchloremia.—Robineau and Lévy recommend the prophylactic injection of hypertonic salt solution for the prevention of the postoperative accidents accompanied by hyperazotemia and hypochloremia. All operations result in disturbances of the organism manifested by various degrees of hyperazotemia with hypochloremia, oliguria, elaboration of large quantities of urea from the nitrogen contained in the tissues (which may remain in the blood or be eliminated in the urine), reduced elimination of chlorine and sometimes functional nephritis from loss of the power of concentrating urea. None of these serologic manifestations are individually responsible for the early or late postoperative accidents; some may be missing and their reciprocal relations are not clear, but these organic disturbances may certainly be considered responsible for the occurrence within from twenty-four to forty-eight hours after operation of an intestinal paralysis with a syndrome of occlusion and general symptoms of toxemia. They must also be considered responsible for the late accidents of the same nature appearing from eight to twelve days after the operation with general weakness, loss of weight and loss of muscular strength. Intravenous injections of hypertonic salt solution are not always efficacious in these grave postoperative accidents, but if administered from the moment the operation is terminated they combat the disturbances produced in the organism. The amount of urea and chlorine in the blood remain practically normal, the rest nitrogen is lowered, uresis is nearly normal, the output of urea in the urine is not increased, and the output of chlorine is not decreased. Clinically, this prophylactic treatment results in a disappearance of malaise after awaking from the anesthetic, a rapidly manifest state of well being, regularity of the pulse, moisture of the mouth, absence of thirst, decrease of vomiting (if it exists), early emission of gases after abdominal operation, and absence of fatigue. The loss of weight and strength is greatly attenuated. Above all, the prophylactic injection of salt protects the patient against all grave accidents not directly due to the act of operation.

Revue Neurologique, Paris

2: 361-440 (Sept.) 1933

Organization of Proprioceptive Centers of Medullobulbopontomesencephalic Axis. J. Nicolesco.—p. 361.
*First Cerebellar Signs in Tumors of Cerebellopontile Angle: Heterolateral Cerebellar Syndrome. K. Henner.—p. 377.

Tumors of Cerebellopontile Angle.—Henner states that tumors of the cerebellopontile angle, before the classic cerebellar syndrome is fully manifest, give rise to the well known symptoms of cerebellar deficiency and also to their opposites. Thus, instead of hypermetria, hypometria may be observed, and in the prehension test the patient may not open his hand immoderately but keep it more closed during the movement itself than would a normal person. The author considers these symptoms the result of cerebellar irritation or hyperfunction and likens them to Parkinson's syndrome, which he regards as a syndrome of cerebellar hyperfuncion, the reverse of the classic cerebellar syndrome. Some symptoms of cerebellar hyperfunction or parkinsonian elements are found in practically every cerebellar syndrome. The author has observed the reverse cerebellar syndrome in ten cases of tumor of the cerebellopontile angle (seven verified; three clinically certain). On the basis of these he describes the topography and order of appearance of the reverse cerebellar symptoms or parkinsonian elements in tumors of the cerebellopontile angle. At first one sees simultaneously with classic cerebellar symptoms certain parkinsonian elements, such as decrease of the pendular movements during walking, circumscribed plasticity in some segment of the extremities, and increase of the elementary posture reflexes, to which, perhaps, belongs the intention tremor (which sometimes diminishes in the later stages). Later, axial symptoms of the vermis appear; here it is difficult to separate the vestibular symptoms from the symptoms of cerebellar irritation, in view of the fact that the gray nuclei of the vermis are counted in the central vestibular system. In this stage heterolateral symptoms of cerebellar hyperfunction can be observed (localized plasticity, increased elementary posture reflexes, and so on). Homolaterally the hyperfunctional cerebellar symptoms disappear rather rapidly, but they persist longer and are more frequent on the heterolateral side. Later, classic symptoms of cerebellar deficiency also appear heterolaterally. Finally, in advanced stages or after trepanation, all the reverse cerebellar symptoms disappear and the classic cerebellar syndrome, more pronounced on the homolateral side, is manifest. While this description of the reverse cerebellar symptoms is schematic, a certain regularity in the order of the symptoms can be observed if one looks for the parkinsonian as well as the classic cerebellar symptoms and for both on the two sides. This regularity is not observed in intracerebellar tumors, which gives the syndrome a practical value in doubtful cases.

Annaes Paulistas de Medicina e Cirurgia, São Paulo

28: 167-262 (Sept.) 1933. Partial Index

*New Species of Salmonella Genus. L. Salles Gomes.—p. 167.
Blood Eosinophilia in Parasitic Infestations. S. B. Pessoa and J. Alves Meira.—p. 175.

New Species of Salmonella Genus.—Salles Gomes isolated four organisms of the Salmonella genus, one from the mucopurulent and bloody feces of a patient in the initial period of a dysenteriform syndrome, one from a specimen of purulent urine, and two from the blood of two patients at the peak of a paratyphoid-like infection which proved to be fatal. The agglutination test, which was performed with only one of the blood specimens, gave strongly positive results. The four organisms proved to have identical characteristics as to morphology, motility, stain and culture reactions and biochemical properties related to their reactions in twenty-one carbohydrates, indole, nitrates, sulphurated and acetyl-methyl carbinol. They caused gas fermentation with salicin, did not produce indole, and were pathogenic to laboratory animals. The emulsion of cultures of the isolated bacteria killed mice and guinea-pigs in from twenty to twenty-four hours after injection into the peritoneal cavity. The intravenous injection of the emulsion produced death in rabbits in from thirty-two to seventy-two hours. Nevertheless, mice receiving the emulsion by mouth did not die. With the aid of Castellani's tests, the author studied the serologic relations between the strains and their corresponding antiserums. He did not find any correlation between the antiserums of his organisms and Salmonella suipestifer (Voldagsen, Newport, Reading and Stanley), typhimurium, aertrycke, paratyphi, schottmülleri and enteriditis. He believes that the organism is a new species of the Salmonella genus and proposes to name it Salmonella pauloensis, since it was isolated from material of patients who were permanent residents of São Paulo.

Prensa Médica Argentina, Buenos Aires

20: 1989-2030 (Sept. 20) 1933. Partial Index

Variations of Arterial and Venous Pressure Provoked by Changes of Position in Normal and Pathologic Conditions. R. A. Bullrich.—p. 1989.
*Pulmonary Syndrome in Mediastinal Polyadenopathy: Case. J. J. Spangenberg and C. Rossi Belgrano.—p. 1997.
*Chloroform in Treatment of Bronchospirochetosis. R. Denis, F. J. Bares and J. D. Aráoz.—p. 2005.

Pulmonary Syndrome in Mediastinal Polyadenopathy.—Spangenberg and Rossi Belgrano state that the compression of some mediastinal organs is usually caused by the presence of tumors and aneurysms in the mediastinum. Roentgen examination of patients presenting clinical symptoms of compression of the mediastinal organs is important, since it may reveal the presence of hypertrophic ganglions as the cause of the compression. The authors' patient, aged 50, presented a pulmonary

syndrome with nonproductive reflex cough, paroxysmal dyspnea and, on auscultation, the presence of respiratory and bronchial murmurs similar to those heard in pneumonia. The clinical picture indicated an acute attack of bilateral pulmonary disease. Nevertheless, there was no fever and the symptoms were of a stationary nature. The roentgen examination showed that the areas of apparent dulness, according to the auscultation, were clear and that the respiratory murmurs, the bilateral congestion of the lungs and the presence of hydrothorax and of paroxysmal dyspnea were caused by compression of the bronchi, the pulmonary veins and the sympathetic and pneumogastric nerves, respectively, by hypertrophic ganglions due to chronic mediastinal polyadenopathy of the patient.

Chloroform in Treatment of Bronchospirochetosis.—Denis and his collaborators report the case of a man who had had apparently cured syphilis in his youth. At examination during his present illness the patient presented bronchospirochetosis, complicated by syphilitic gummatous laryngitis. The patient received six treatments with chloroform inhalations, which were given at intervals of from twenty-five to thirty minutes. The chloroform treatments were given in doses of 5 Gm. each, except the first in which the patient received 10 Gm. The treatments were given at three day intervals, except the second and third, which were given ten days apart on account of the intense laryngeal shock that the patient presented while taking the first inhalations during the second treatment. The ultramicroscopic examination of the sputum after the last treatment showed complete absence of spirochetes, which still persists five months after the end of the treatment. The syphilitic gummatous laryngitis was completely cured by the administration of bismuth compounds.

Archiv für Kinderheilkunde, Stuttgart

100: 65-192 (Sept. 29) 1933

Alcaligenes Abortus Infection (Undulant Fever) in Small Children. W. Hauptmann and K. Eberle.—p. 65.
*Active Immunization Against Chickenpox. Z. von Gulácsy.—p. 75.
Rare Abdominal Disorders in Nurslings. H. Fleischer.—p. 80.
Observations on Malignant Diphtheria. A. Stroé.—p. 86.
Rare Deformities of Vertebral Column and Their Erroneous Diagnoses. M. Jachens.—p. 98.
Clinical Aspects of Gonorrhea in Children. L. von Dobszay.—p. 106.
Case of General Granulomatous Xanthomatosis (Schüller-Christian's Disease). F. von Bernuth.—p. 115.
*Sugar Therapy in Nephritides. Z. von Bókay and L. von Kostyál.—p. 123.
Clinical Investigations on Catalase in Blood of Healthy Children. Ursula Krätschell.—p. 139.
Peculiarities of Poliomyelitis Epidemic in Szeged in 1932 and Experiences with Prophylactic Vaccination. K. Waltner.—p. 147.
*Allergy Theory of Chickenpox in Case of Encephalitis and of Severe Bilateral Choked Disk. E. Mayerhofer and J. Breitenfeld.—p. 155.
Long Continued Metabolic Investigations on Healthy Nurslings. E. Rominger and H. Meyer.—p. 167.

Active Immunization Against Chickenpox.—Von Gulácsy reports his experiences with active immunization against chickenpox in the course of an epidemic in a children's clinic. Vaccination was done in most cases by intracutaneous injection. Only in five cases was scarification done according to Kling's method. The fresh vesicular contents were collected in sterile capillary tubes, diluted 1:10 with an isotonic solution of sodium chloride, and injected into the skin. All children who were not vaccinated developed chickenpox, while of those who were vaccinated only 13 per cent contracted the disease in an abortive form. Thus it can be said that the vaccination has excellent protective value. The development of the immunity is not dependent on local reactions. Circumscribed reddishness and slight infiltration were present in only a few cases and were probably the result of mechanical irritation. Studies of the blood pictures disclosed that the vaccination produces the same changes as does the disease.

Sugar Therapy in Nephritides.—Von Bókay and von Kostyál treated acute nephritis with an exclusive sugar diet. For a number of days, usually until improvement sets in, the patients are given from 250 to 400 Gm. of malt sugar or potato sugar and nothing else. After that some fruit and a little water are added, and gradually a mixed diet is again introduced. The authors employed this treatment in fifty cases. Acute hemorrhagic glomerular nephritis was found in thirty-four of the patients; four had subacute hemorrhagic nephritis, five chronic nephritis, six nephrosis, and one a scarlet fever nephritis complicated by erysipelas and sepsis. This patient died on the day following hospitalization. The patients with acute nephritis recovered in fifteen days or less, and those with chronic nephritis or nephrosis recovered in from fifteen to thirty days. The exclusive sugar diet rests the kidneys and thus promotes the recovery. The favorable effect of the sugar diet is partly the results of a direct action on the intermediate metabolism and partly of an indirect action by way of the liver. The sugar diet also influences the disturbed water exchange that exists in renal inflammations. It reduces the oncotic pressure of the blood and tissues, increases perspiration and reestablishes the renal and extrarenal elimination of water.

Allergy Theory of Chickenpox in Case of Encephalitis.—Mayerhofer and Breitenfeld report the history of a boy, aged 14, who nineteen days after the first appearance of chickenpox (that is, within the period of the appearance of allergic reactions) developed encephalitis with hydrocephalus followed by bilateral choked disk of 6 and 5.5 diopters and complete loss of vision. The chickenpox that preceded the encephalitis was extraordinarily severe (confluent varicella with variola-like scars). The epidemic in the patient's home town was mild and particularly the person who had infected this patient had a rather mild form of chickenpox. Smallpox could be excluded epidemiologically as well by the fact that the patient had been vaccinated during the first year of life and again when admitted to school (presence of four large vaccination scars). The deleterious results of the bilateral choked disk could be counteracted neither by lumbar puncture nor by the simple puncture of the corpus callosum. The choked disk did not disappear until after Förster's operation had been done. After that, vision was gradually restored, until after eight months it had become completely normal again. The authors assert that the literature contains no other report of encephalitis due to chickenpox with such a severe form of choked disk. In the etiologic interpretation of this encephalitis they accept Glanzmann's allergic theory. They base this assumption on the development of the second disease nineteen days after the first appearance of the eruption and also on the fact that the patient retained a hypersusceptibility to the smallest quantities of iodine, owing to sensitization of the brain in the course of the operation. Minute doses of iodine elicited epileptic spasms of the jacksonian type.

Deutsche medizinische Wochenschrift, Leipzig

59: 1453-1488 (Sept. 22) 1933

Status Lymphaticus as Peculiar Behavior Toward Infection. F. Munk.—p. 1453.
Psychoses in Internal Diseases. K. Schneider.—p. 1458.
Saprophytes of Milk and Their Significance. G. Bessau.—p. 1461.
Disturbances in External Secretion of Pancreas. K. Nissen.—p. 1464.
*Complement Fixation Reaction in Tuberculosis During Childhood. G. Joppich.—p. 1466.
*Sources of Error in Cultural Demonstration of Tubercle Bacilli in Blood. E. Loewenstein.—p. 1468.
Spontaneous Pneumothorax Without Recognizable Cause. J. Woll.—p. 1469.
New Pneumothorax Needle. F. Hochstetter.—p. 1470.

Complement Fixation in Tuberculosis During Childhood.—In testing the reliability of the Leuchtenberger-Lorenz complement fixation reaction, Joppich found that, although the reaction frequently gives positive results in active tuberculosis in children, it does so also in apparently inactive cases. Consequently it cannot be used in the differentiation of active and inactive tuberculosis. To be sure, the objection may be made that the "inactive" cases have been wrongly estimated; that, namely, an active process was present but could not be detected with the available methods. But to this objection the reply may be made that the reaction was also positive in a considerable number of children who were not infected with tuberculosis, which proves that the reaction is not sufficiently specific and consequently is not suitable for diagnosis in pediatric practice. The author recommends that in all complement fixation tests for tuberculosis the specificity be tested first by performing the test on serums from children who are known to be free from tuberculosis.

Sources of Error in Demonstration of Tubercle Bacilli in Blood.—Loewenstein admits that his method of demonstrating tubercle bacillemia is difficult, but he thinks that, if certain

errors in the technic are avoided, the negative results reported by many investigators, even in severe cases of tuberculosis, will diminish and the importance of the blood culture will be realized. In acute articular rheumatism, in which so many investigators obtained negative results, it is important to withdraw the blood during the increase in fever and before treatment with salicylic acid has begun. The earlier stages of a disorder are, as a rule, better suited for the blood culture than the later stages. In tuberculosis, for instance, the blood culture may be positive at a time when the roentgenogram is still negative. The author emphasizes that during the withdrawal of the blood no disinfectant should be used, such as corrosive mercuric chloride or iodine. The walls of the tube in which the blood is withdrawn should be moistened with a 10 per cent solution of citrate. Immediately after the withdrawal, the blood should be well shaken so as to prevent coagulation, for once the tubercle bacilli have been enclosed in the clot of fibrin they cannot be liberated again in the living state. The complete removal of the hemoglobin is another important factor. The culture medium should not be older than ten days and, in preparing it, care should be taken that during the coagulation the temperature does not exceed 85 C. Sterilization should be done in the steam sterilizer, never in a dry sterilizer. After the culture medium has been inoculated, the tubes should be closed air tight by means of sealing wax, because the smallest air hole will lead within three weeks to drying out and hardening of the culture medium. The author maintains that with his method tubercle bacillemia can be demonstrated not only in the various forms of tuberculosis (lungs, eyes, bones, skin and intestine) but also in other disorders, such as rheumatism, polyarthritis and dementia praecox.

Deutsche Zeitschrift für Chirurgie, Berlin

241: 505-632 (Oct. 9) 1933

*Studies in Physiology of Healing of Fracture: Appearance and Effect of Phosphatases. O. Timpe.—p. 505.
*Id.: Healing of Fractures and Carbohydrate Metabolism. O. Timpe and H. Reich.—p. 517.
Pathology and Treatment of Snapping Temporomaxillary Joint. G. Steinhardt.—p. 531.
Physiologic Basis for Functional Treatment of Uncomplicated Vertebral Fractures. H. Kraus.—p. 553.
Clubfoot: Varieties of and Treatment. Wilhelm.—p. 572.
Experimental Basis for Organotherapy in Diseases of Liver and Biliary Tracts. W. Felix and P. Kahn.—p. 586.
Clinical Aspects and Treatment of Subcutaneous Rupture of Liver. T. Herbst.—p. 602.
Technical Advances in Roentgenographic Relief Presentation of Central Nervous System in Animal Experiments. Wustmann.—p. 615.
After Phase of Blood Clotting. E. Mackuth.—p. 619.
Surgical Intervention in Duodenal Ulcer. O. Orth.—p. 626.

Physiology of Fracture Healing.—According to Timpe, Robinson demonstrated the existence of phosphatases, principally in the cartilage and to a lesser degree in the various organs and tissues of young animals, which play an important part in the ossification of bones. These phosphatases are split off from the hexose diphosphoric and glycerophosphoric acids. Timpe found that these phosphatases are likewise present in the muscles and cartilage of adults under normal conditions. He further showed that there exists in the human organism in the course of healing of a fracture a third phosphatase, which splits phosphoric acid from nucleinic acid. The rôle of this phosphatase in the healing process is just as important as that of the other two phosphatases. It was present in the callus, in the bones at the seat of the fracture, and in the muscles in the vicinity of the fracture. Its production in the muscles appears to be due to the formation and absorption of the hematoma in the muscle. The author considers the breaking down of cells the cause of the appearance of this phosphatase in the muscle, because the nucleinic acid splitting phosphatase is found not only when a fracture exists but also as a result of postmortem changes.

Healing of Fractures and Carbohydrate Metabolism.—Timpe and Reich state that urinalysis at regular intervals in several hundreds of patients presenting healing fractures demonstrated glycosuria in only one instance. This was of a short duration and accompanied by a mild hyperglycemia. Determinations of blood sugar in nineteen of the patients demonstrated hyperglycemia in two instances (10 per cent). Hyperglycemia was present in eight out of twenty-three cases of injury to the skull (35 per cent). In concussion of the brain, hyperglycemia was found with equal frequency regardless of the existence of a fracture of the skull. The hyperglycemia developed shortly after the injury and persisted for a brief period only. A persistent rise of blood sugar was not observed. A traumatic diabetes probably does not occur. The transient traumatic glycosuria as well as hyperglycemia is apparently of a central nervous origin. In concussion of the brain the effect on the metabolic centers is a direct one, and in fractures of the extremities an indirect one. Stimuli proceed along sympathetic paths from the seat of fracture to the centers, which in their turn send out efferent impulses to the organs that control the carbohydrate metabolism and the liver, kidneys, suprarenals and pancreas.

Deutsches Archiv für klinische Medizin, Berlin

175: 505-636 (Sept. 14) 1933

*Action Mechanism of Oral Iron Medication on Intestinal Flora. H. Lotze.—p. 505.
*Pathologic and Clinical Aspects of So-Called Thrombosis of Splenic Vein. H. Lichtenstein and K. Plenge.—p. 520.
Capillaroscopic Observations in Purpura: Contribution to Knowledge of Hemorrhagic Diathesis. E. Jürgensen.—p. 534.
Combined Functional Test of Heart and Lungs. W. Borgard and J. Hermannsen.—p. 545.
Unilateral, Continuous, Rhythmic-Clonic Spasms in Region of Palatine, Pharyngeal and Laryngeal Musculature. L. M. Kugelmeier.—p. 557.
Rhodan Metabolism: Rhodan Content of Blood, B. Stuber and K. Lang.—p. 564.
Changes in Finer Hepatic Vessels in Hypertension. H. Gebhardt.—p. 568.
Clinical Aspects of Tricuspid Insufficiency. M. Fingerhuth and O. Bickenbach.—p. 577.
*Diet Free from Chlorides with Withdrawal of Gastric Juice in Ulcer and Gastritis. G. Katsch and K. Mellinghoff.—p. 614.
Amyloid Nephrosis with Uremia in Carcinoma of Colon. Lydia Kühnel.—p. 628.

Iron Medication and the Intestinal Flora.—Lotze reports experimental bacteriologic investigations on the action mechanism of high doses of iron. The experiments disclosed that high doses of iron have a bactericidal action on the aerobic as well as on the anaerobic intestinal flora. From this he concludes that the former opinion about the action mechanism of iron has to be extended, for its value lies not only in its direct influence on the synthesis of hemoglobin but also in its action on the intestinal flora. Whether this explanation applies only to the anemias that develop in grave colitis, in sprue or following the exclusion of larger portions of the intestine, or whether it applies also to anemias of different origins will require further investigations.

Thrombosis of Splenic Vein.—Lichtenstein and Plenge discuss the differential diagnosis of chronic tumors of the spleen in hematopoietic and in hepatolienal disturbances and the confused nomenclature of splenomegaly, splenic anemia, Banti's disease and pseudo-Banti's disease. A case of their own observation presented the symptomatology of thrombosis of the splenic vein, while its anatomic examination disclosed a pronounced proliferation in the splenic pulp, reticulum and connective tissue, without involvement of the splenic vessels. On the basis of thirty-two cases reported in the literature, the authors outline the syndrome of thrombosis of the splenic vein and call attention to a group of cases in which, although the symptomatology is the same, thrombotic changes in the walls of the splenic vessels are absent. Thus the symptomatology of thrombosis of the splenic vein includes disturbances of various origins, and there is really only a syndrome of thrombosis of the splenic vein, not a disease entity. The authors attempt a classification of the cases of thrombosis of the splenic vein on the basis of the anatomic aspects. They differentiate true thrombosis of the splenic vein, true thrombosis of the splenic and portal veins, and chronic inflammatory (?) splenic tumor without involvement of the splenic vessels.

Chloride-Free Diet and Withdrawal of Gastric Juice in Treatment of Ulcer.—In the treatment of fifty-five patients having ulcer and of fifteen patients having gastritis, Katsch and Mellinghoff employed a "salt-free" diet. The foods were selected and the sodium chloride was restricted in such a manner that the daily intake of sodium chloride did not exceed 1.2 Gm. In addition to this, gastric juice was withdrawn by means of a permanent catheter, at first daily and later at intervals, and in

order to reduce the sodium chloride still further, salyrgan was injected to stimulate diuresis and chloride elimination. The effect was favorable and lasting improvement could be observed. The improvemcnt was most noticeable in patients presenting hypersecretion, and even cases that had been refractory to the usual therapeutic procedures quite frequently yielded to this treatment. The hypersecretory and the refractory cases are the primary indication for the treatment, but in pyloric stenosis with persistent vomiting and in hypochloremia the treatment is contraindicated. There is a considerable loss of sodium chloride from the tissues, and the gastric secretion is reduced primarily as regards the quantity of juice, but less as regards the acid concentration and the total chloride content.

Klinische Wochenschrift, Berlin

12: 1473-1512 (Sept. 23) 1933

Ray Sense of Human Beings. H. Ehrenwald.—p. 1473.
Fundamentals of Etiology of Goiter. B. Breitner.—p. 1475.
Investigations on Haff Disease. Bürgers.—p. 1477.
Synthesis of Uric Acid in Birds. W. Schuler and W. Reindel.—p. 1479.
Elimination of Gonadotropic Hormone of Anterior Lobe of Hypophysis in Functional Disturbances of Female Gonad. C. Kaufmann and O. Mühlbock.—p. 1480.
*Migrating Phlebitis: Its Treatment. A. Buschke and A. Joseph.—p. 1483.
Estimation of Air Chamber Function of Aorta by Means of Velocity of Pulse Wave. H. Ude.—p. 1484.
*Epinephrine Secretions in Insulin Hypoglycemia and in Pal's Vascular Crises. B. Kugelmann.—p. 1488.
Influence of Purine Bodies on Heart Action. E. Flaum and R. Rössler.—p. 1489.
Standardization of Male Sex Hormone on Fish. E. Glaser and O. Haempel.—p. 1491.
Structure of Erythrocytes. K. Glaeser.—p. 1494.
Culture of Human Tumors in Vitro. Z. Zakrzewski and W. Kraszewski.—p. 1495.
Involvement of Tongue in Diseases of Internal Organs. W. Pagel.—p. 1496.

Migrating Phlebitis.—Buschke and Joseph review the literature and report a case. Resection of thrombosed veins and injections with a circulatory hormone preparation proved unsuccessful. They resorted to inunctions of mercury and later combined this treatment with the administration of an iodine solution. The inunctions of mercury were made daily with 3 Gm. of the ointment. After three weeks a considerable improvement was noticeable and after two months the phlebitic changes had largely disappeared and the pain had entirely subsided. An examination after six months revealed that the favorable effects had persisted. The authors think that the good results were primarily achieved by the mercury but admit that the iodine may have helped. They consider this success the more noteworthy since all former therapeutic measures failed to bring the desired results, largely owing to the fact that a causal therapy has been impossible, because the cause of migrating phlebitis is not completely understood as yet. They consider most probable the presence of a latent infection, which flares up through external influences of a traumatic or chemical nature. The occurrence of similar venous disturbances on a syphilitic and tuberculous basis seems to corroborate this theory. In some cases of migrating phlebitis the anamnesis discloses previous acute infectious diseases, such as typhoid and influenza. Other authorities assume a focal infection in the oral cavity, while one assumes a toxic or infectious disturbance of the sympathetic nervous system, which in turn causes angiospastic manifestations with circulatory disturbances and impairment of the vascular walls. The authors consider the latter theory more likely than that of an allergic origin.

Epinephrine Secretion in Insulin Hypoglycemia.—Kugelmann gained the impression that the hypoglycemic symptoms, palpitation of the heart, tremor, pallor and feeling of pressure over the sternum, are not the direct result of the action of insulin but are caused by an increased secretion of epinephrine. He reasoned that if this theory was correct it should be possible to produce by the simultaneous administration of ergotamine tartrate and insulin a hypoglycemic condition in which the epinephrine symptoms would be absent, as it is known that ergotamine tartrate checks the effects of epinephrine. By the simultaneous administration of insulin and ergotamine tartrate he succeeded in producing in four out of ten patients a hypoglycemic condition in which involvement of the vascular and circulatory apparatus was absent. This proves that the hypoglycemic condition consists of two components, a direct insulin action and a regulatory epinephrine action. In Pal's vascular crises, during increase of blood pressure the author observed hyperglycemia, hyperleukocytosis and lymphocytosis, conditions that can be explained by an endogenic epinephrine elimination.

Medizinische Klinik, Berlin

29: 1363-1394 (Oct. 6) 1933

Pityriasis Versicolor Achromica. C. Bruhns.—p. 1363.
Studies on Therapeutic Action of Vaccine Immune Serum. K. vom Hofe and W. Krantz.—p. 1366.
Relations Between Right and Left Handedness and the Functional Predominance of one Hemisphere. R. Klein.—p. 1367.
*Elicitability of Babinski's Toe Reflex. O. Marburg.—p. 1369.
Morphology of Erythrocytes Following Venesection. A. Bergel and F. Kummer.—p. 1369.
Treatment of Gastric and Duodenal Ulcers. H. Schwarz and M. Taubenhaus.—p. 1372.
Treatment of Lobar Pneumonia. F. Bardachzi and W. Sekeles.—p. 1374.
Suicide Attempt with Atropine. H. Jaeger.—p. 1377.
Disease Condition of Nasal Septum in Workers with Arsenic. Dreschke.—p. 1378.
*Baths with Irradiated Salt Solutions. H. Szerdotz.—p. 1378.
*Simple Method for Rapid Staining of Blood Preparations. M. Gutstein.—p. 1381.
Determination of Blood Sugar by Means of Step Photometer. C. Urbach.—p. 1381.
Surgical Treatment of Injuries of Hand and Finger. J. Schmorell.—p. 1382.

Babinski's Reflex.—According to Marburg, the reflexogenic zone of the Babinski reflex is quite extensive. Babinski first elicited it by stimulating the medial edge of the soles of the feet. Later, reports appeared about the elicitability from the external edge, from the balls of the toes, from the achilles tendon, by stroking the crest of the tibia or by lifting the toes and suddenly releasing them and by bending the knee against the resistance of the pressure of the hand. However, knowledge on the connection between the various means of eliciting the reflex and the pathologic-anatomic changes is still deficient, for Goldflam's attempt to employ Rossolima's modification for the differential diagnosis of multiple sclerosis did not prove reliable. The author points out that Edelmann proved in 1920 that Babinski's sign could be elicited in cases in which Kernig's sign is positive, particularly when meningitis or cerebral edema exists. Edelmann could show that in cases of meningitis, when the leg with extended knee is bent at the hip joint, a dorsal flexion of the great toe is frequently observed, although Kernig's sign may be negative. This symptom may become positive in an early stage, particularly in senile meningitis, in which rigidity of the neck and Kernig's sign may be absent. Moreover, the symptom also occurs in cerebral edema. In meningitis it disappears toward the end, but in cerebral edema it persists until death. The author watched for this symptom and his observations corroborate Edelmann's report. He also made anatomic studies in two cases in which the symptom had persisted until death. These two patients had had hypertension, and the histologic examination disclosed severe edema of the brain and the meninges. Two patients with cerebral tumor, who had a meningitic symptomatology, likewise presented the symptom. The histologic examination revealed no signs of meningitis but disclosed edematous conditions. Since it has been assumed that the Babinski reflex is indicative of impairment of the pyramidal tract, the author examined the pyramidal tracts histologically, but they proved intact in the patients with cerebral edema. Thus Edelmann's symptom is indicative of meningitis or of meningeal or cerebral edema. It should be remembered that the symptom may appear without Kernig's sign and that in edema it persists until death, while it may disappear in meningitis. Moreover, the development of this sign is not dependent on the presence of a lesion of the pyramidal tract. A lesion of the cerebral cortex or of the meninges is apparently sufficient for its appearance.

Baths with Irradiated Salt Solutions.—Szerdotz shows that by the use of irradiated salt solutions a new principle has been introduced into balneotherapy. A solution of a mixture of potassium salts is irradiated for seven minutes with red light and then for fifteen minutes with the quartz lamp. One liter of this solution is then added to the bath, which has a temperature of 36 C. (96.8 F.). The bath lasts twenty minutes and,

following it, the patient rests from one-half to one hour. The first few baths usually produce a decided euphoria, but after seven or eight baths the pains often become severe again. If the reactions are too severe, the treatment should be interrupted for several days. However, after twenty baths have been given there is usually a decided improvement. The author employed the baths in the various forms of arthritis and in neuritis, myalgias and rheumatoids, with favorable results. He ascribes the efficacy of the baths to actinic energies of the irradiated salts. He thinks that certain micro rays, perhaps beta rays, are liberated in the bath and exert an activating influence on the various functions.

Simple Staining Method for Blood Preparations.—Although the panoptic method of blood staining devised by Pappenheim gives excellent results, Gutstein made efforts to find a new one that would be less complicated and more rapid, so that it could be used by the practitioner during consultation. The stain prepared by him contains methylthionine chloride 2 B, thionine and acid eosin dissolved in methyl alcohol. The first preparation of the stain is somewhat complicated, but it can be kept in readiness for quick use. The prepared stain is dropped on the blood smear. After three minutes the fixation is complete and distilled water is added so as to distribute the stain evenly. Rinsing with distilled water is followed by drying with filter paper. The nuclei of the lymphocytes and monocytes show a dark violet stain, while the protoplasm appears grayish blue. The nuclei of the neutrophil leukocytes are distinctly violet, and differentiation between segmented nuclei and rod-shaped nuclei is easy. The protoplasm of the neutrophils contains fine pinkish to rose-violet granules. The eosinophils show large red granules and a violet nucleus. The mast cells have large, dark violet or red-violet granules and the nuclear stain is usually indistinct. The blood platelets appear as pale bluish-violet bodies. The author states that his staining method somewhat modified can be used also for a prolonged staining of blood smears, and he is convinced that in this case it is not inferior to Pappenheim's panoptic method.

Münchener medizinische Wochenschrift, Munich

80: 1459-1496 (Sept. 22) 1933. Partial Index

Campaign Against Tuberculosis and Racial Improvement. R. Griesbach. —p. 1459.
*Circulation and Respiration in Pulmonary Tuberculosis: Their Significance for Indications for Collapse Therapy. R. Cobet.—p. 1461.
*Behavior of Blood Pressure in Hyperventilation and Oxygen Inhalation. K. Voit and J. Cyba.—p. 1466.
Articular Fractures. D. Kulenkampff.—p. 1468.
Treatment of Exophthalmic Goiter by Means of Iodine and Arsenic. P. Müller and K. Livadas.—p. 1471.
Unusual Case of Periarteritis Nodosa. F. Kreuter.—p. 1473.
Local Therapy of Skin Diseases with Vaccine of Colon Bacteria. R. Rodt.—p. 1476.
Intravenous Injection. H. Doerfler.—p. 1477.

Circulation and Respiration in Tuberculosis.—Cobet differentiates between circulatory disturbances caused by toxic factors and those due to mechanical influences. He emphasizes that acute toxic circulatory disturbances do not contraindicate collapse therapy of pulmonary tuberculosis but indicate it when the toxin resorption can be checked by the collapse therapy. Chronic toxic circulatory disturbances due to toxic impairment of the myocardium contraindicate collapse therapy only when they are especially severe, which has to be determined by functional tests. In this connection the electrocardiogram and the work test are of especial value. In discussing the mechanical influences of tuberculosis on the circulatory organs, the author mentions especially those caused by the displacement of the heart and of the large vessels and those produced by the inhibition of the respiration, particularly by shrinking. He describes the symptomatology, the electrocardiographic aspects and the respiratory conditions in these disturbances and shows that the impairment of the pulmonary function can be determined on the oxygen deficiency of the arterial blood or on the rapidity of the circulation. In patients with manifest pulmonary insufficiency, collapse therapy is as a rule inadvisable. The author considers Kauffmann's water test unsuitable for the determination of the circulatory function of patients with pulmonary tuberculosis. He discusses the circulatory disturbances produced by collapse therapy. He maintains that partial pneumothorax, in which the heart is hindered by adhesions, is most frequently the cause of circulatory disturbances, but that phrenic exeresis also may lead to impairment of the circulatory function. He states that not every one who wishes to resort to collapse therapy has to perform all the complicated tests described by him, for the final decision should be based on the clinical observation. He emphasizes, however, that the tests sharpen the diagnostician's eye.

Behavior of Blood Pressure in Oxygen Inhalation.—Studies by other investigators on the relations between hypertension and dyspnea induced Voit and Cyba to investigate the influence of hyperventilation and of oxygen inhalation on persons with normal, high and low blood pressures. It was found that under the influence of hyperventilation only some of the persons with normal blood pressure show a slight decrease in pressure, while persons with hypertension regularly show a small and temporary decrease in blood pressure. The influence of oxygen inhalation on the blood pressure was less noticeable and less regular in that only some of the patients with essential hypertension reacted with a slight decrease. Thus the experiments indicate that stimuli to which persons with normal pressure react only slightly or not at all elicit as a rule a noticeable reaction in patients having hypertension. This proves the abnormal reactivity of the vascular apparatus in essential hypertension. Persons with hypotension, on the other hand, are completely refractory to the stimuli. Carbon dioxide inhalation produces in all three groups a noticeable increase in blood pressure. In this case the stimulus is evidently so strong that even the persons with hypotension react to it.

Svenska Läkaresällskapets Handlingar, Stockholm

59: 161-232 (No. 3) 1933

*Prognosis in Intrathoracic Tuberculosis in Childhood. C'en. J. Lundquist.—p. 161.
Possible Method in Treatment of Hemophilia? H. von Samson-Himmelstjerna.—p. 231.

Prognosis in Tuberculosis in Childhood.—In his after-examination in 926 cases of children up to the age of 15 years treated in the Stockholm hospital for tuberculosis from 1910 to 1920, Lundquist found that about one fourth of all the children died from tuberculosis, three fourths of the deaths occurring in the first five years after infection. The mortality curve showed two peaks, one for children infected in the first years of life and a lower peak for those infected at puberty. The prognosis was best for children between the ages of 3 and 6. Of the 671 surviving out of the 926, 78.2 per cent were well or without signs of active pulmonary tuberculosis on examination after discharge. In tuberculosis of the bronchial glands and in cases showing massive parenchymal indurations the prognosis was favorable, but less favorable in cases showing roentgenologically demonstrable disseminated parenchymal indurations. In cases in which there were large cloudy shadows with indefinite contour the prognosis was grave: about half of the patients had open tuberculosis and 62.9 per cent died from tuberculosis, mostly within one year after admission. Of children not roentgenologically examined but having probable parenchymal lesions, 20 per cent died from tuberculosis. The prognosis was especially grave in cases presenting constant hard râles and bronchial respiration: 40 per cent of these patients had open tuberculosis and 87.2 per cent died from tuberculosis, more than one half within half a year and more than 70 per cent within one year after admission. Of tuberculin positive children not having certain clinical or roentgenologic changes, 16.4 per cent died from tuberculosis. In open tuberculosis the prognosis was extremely grave, with a mortality of 86.9 per cent, 60 per cent of the children dying within the first year and 86.3 per cent within the first three years after demonstration of tubercle bacilli in the sputum; 84.5 per cent of these patients were approaching or at the age of puberty, and there were twice as many girls as boys. Of the eight children who had open tuberculosis and were given pneumothorax treatment, three were alive. Whooping cough and scarlet fever had no noticeable effect on the tuberculous process, measles usually caused a transient aggravation, and epidemic influenza produced in some cases a flare-up or an aggravation with fatal outcome and in most cases no aggravation or only a temporary aggravation.